

**KA**  
**KOT HIKAI SHNA RADIO**  
(PRACTICAL)

KA HOK LONGTRAI  
LA TYNGKAI

DA

U M. Morton Roy Nongrum.

Ka Dor Rs. 4/-

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Ia kane ka Kot Hikai shna Radio  
(Practical) nga la thoh ban sah jingynmaw  
ieit burom ia la I Pa jong nga I Methuenton  
Jyrwa Iba long u Tymmenbasan ka Balang  
Mawkhar, ia kaba U Trai u la ibit ban khot  
noh ia I ha ka I I tarik June 1975.

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UMSOHSUN SHILLONG,  
The 1st Jan 1979.

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## CHILDREN'S CORNER

### TANG SHIKYNTIEN

Ha kine ki por ngi im, ha kaba ka Science ka iaiba sharang ha kiba bun ki bynta. Kumta ngi la dei ban ia bud ia kane ka juk da kaba ngi ia beh lang ban tip eiei shaphang ka Electronic bad kiwei kiwei. Ngi la dei ban pyndemia la lape ha ngin ia ioh bynta lem hakaliang ka Electronic age, ban ia tih ha kata ka par ksiar jong ka. Baroh u briew u long uba stad laia u pyndonkam hok ia la ka por bad u wad ia kiei kiei da ka jingsngewrit, ka jingiaishah bad da kat jinghrang ban lap ia ka, un lap hi ruh ha kaba khadduh, khlem don jingar-, tatien ei ei ruh em.

Ha kane ka jingpyrshang barit jong nga, kin don bun ki jingduna bad jingbakla hangne hangtai, bad kaba lah lehse ban pynsngewthuh bakla ia kito kiba la kham tip bha ha kane ka liang, kumta nga iehnoh ha ki para ri ban ia weng lem ia kito ki phngit ki phngar ki bymdei bad ban pyndap da kiba dei ha ka jaka jong ki. La thoh ruh ha kane ka kot tang katto katne kiei kiei, kiba la ju pynlong ia ka Radio ba kan sniew khah khah, bad ruh kumno ban lap ia kita kiba la sniew; khnang ba ka Radio kan bha pat, ynda la weng ia kita kiba la sniew ne pynbha pat ia ka. Bad la thoh ruh tang ia kito ki jaid Radio kiba ju pyndonkam paitbah kum (1) Ka Power Transformer Set AC. (2) Ka AC/DC Series Filament Type. (3) Bad ka Transistor Set.

M. Nongrum.

Dated 1st Jan. 1979.  
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## KA JINGKDEW LAMPHRANG

1. Kane ka kot kam dei ka kot kaba batai ia ka Radio Theory, hynrei ka dei beit tang ku practical, kaba batai kumno ban lap la ki jingsniew kiba don ha ka Radio ha kiba bun ki rukom. Bad ka long ruh ka kot kaba dei tang ia kito kiba la ioh jinghikai ha ki skul Radio, sha-phang ka radio theory bad ha kajuh ka por kan iarap ruh ia kito kiba dang shutip malu mala, kumno ban shna pynbha (repair) la ka Radio.

2. Ki nongshna Radio shuwa ba kin shna Radio ki dei ban long kiba la don lypa ki tiar kiba paka, khnang ba haba ia kynduh ia kano kano ka jingeh, kin long kiba la kieng atiar bha ban ia ai reng bad kata ka jingeh. Kine harum ki long ki katto katne ki tiar kiba donkam eh ia u nongshna radio ba u dei ban don.

(a) *Ki Meter* (b) *Ka Signal Generator* (k) *Neon tester*  
(d) *Ka Valve bad ka Transistor testor* (e) *Ka Signal injector*  
(g) *Ka Circuit diagram.* (ng) *Ka Valve bad ka Transistor*  
Data (h) *Ki tiar trei* (i) *Bad katto katne ki spare parts.*

(a) **Ki Meter** :—Ki meter ki long kiba donkam bha ha kaba shna Radio. Khlem ki Meter ka jingtnei ka isid dkoh. Bad ym lah ban tip ia ki voltage jong ki tiar kiba don ha ka radio. Kumta u Vacumm Tube Voltmeter bad u Volt-ohm meter ki long kiba donkam bha, ba u nongshna radio idei ban don.

(i) **U Vacumm Tube Voltmeter lane VTVM** :—Da une u meter lah ban thew ia ka voltage kaba rit eh, kum ha ka AVC line bad ha ka bynta jong u Osoillator grid bad ha kiwei kiwei ki bynta. Ha kajuh ka por lah ruh ban thew ia ka current kaba don ha ki tiar jong ka radio.

(ii) **U Volt-ohm meter lane VOM** :—Une u meter u don ka jingkhlain haduh 20,000 Ohms man ka shi volt. Da une u meter lah ban thew ia ka jingdon continuity, ia ka Ohms bad ia ka Vhltage jong ka AC lane OC, kaba don ha ki tiar jong ka radio. Hynrei da une u Meter pat ym lah ban thew ia ka current jong ki tiar kiba don ha ka radio.

Kine harum ki long ki jingpyni kumno ban pyndonkam ia u Meter VOM.

(i) **Haba thew ia ka continuity bad Ohms** :—Bsuh ia ki sainar (test loads jong u Meter ha ki thliw Ohms ia uba iong sha ka thliw kaba don ka dak (—) lane Com (kaba mut Negative ne Common). Bad ia u sainar saw pat sha ka thliw ba don ka dak (+) (kaba mut positifel lane I Meg Nangta pyndei lang ia kine ki sainar iong bad ba saw na ki khmat jong ki. Phin iohi ba u jingkdew ha u Meter u khiih bad leit ieng sha u dak ba thoh 0 Ohm. Ynda pypilait neh ia kine ki jingpyndei, u jingkdew un wan phai pat sha la ka jaka.

Mynta shlm ia u Transformer u bym pat pyndait ha ka Radio. Pyndei ia u khmat jong u sainar iong uba wan na u Meter ha uwei u khmat jong u Transformer bad ia u sainar saw ha uwei pat u khmat sainar jong u Transformer. Nangta peit la u jingkdew ha u Meter u khiih ne em. Lada u khiih kata ka mut ba u coil jong u Transformer u don continuity bad ha kajuh ka por peit u don katno Ohms. Haba u pyni continuity bad ia ka Ohms, kata ka mut ba u Transformer u dang bha. Bad lada u pyni tang ia ka Continuity, hynrei ia ka Ohms pat u pyni 0 Ohms. Kata ka mut ba u coil jong ka Transformer u la sniew (short). Kumjuh ruh lada um pyni continuity kata ka mut ba u Transformer u la sniew, ki sainar ha u Transformer ki la dkut shapoh. Da kane ka rukom lah ban thew ia ki sainar jong u coil ha ka Speaker bad ka jingorpait ka Printed circuit bad kiwei kiwei.

(ii) **Haba thew (test) ia u Resistor** :—**Haba** ia ki sainer (test leads) ha ki khiew Ohms jong u Meter kumbe la kdew haneng. Pyndei ia u sainer long ha u khmat sainer jong u Resistor bad ia uwei pat u sainer saw ha u khmat sainer jong u Resistor. Peit ia u Meter ia u jingkdew u khieh ne em, lada u khieh bad u pyni ia ka Ohms kata ka mut ba u Resistor u dang bha, bad lada um pyni ei ei kata ka mut ba u la sniew. Haba thew kumbe kymaw ban ym thew da kaba bat da ka kti ia kito ki sainai kiba lyngkhuid namar ym lah ban tip la u Resistor u pyni continuity ne ka met jong phi ka pyni continuity ne resistance. Namar kata haba thew kumbe bat na ki jingbat ba la buh lupa khnang ban ym sangwthuh bakla.

Haba thew ia ka Resistor kiba la pyndait ha ka Radio kymaw ban da pynlip shuwa ia ka Radio bad loit noh shuwa ia uwei u khmat sainer jong u Resistor na ka circuit bad sa thew continuity ne resistance jong u.

(iii) **Haba thew ia u Condenser** :—**Haba** thew ia u Condenser pat ka long da khongpung ia khei ba la batai haneng. Hangne lada u Condenser u dang bha un ym pyni ia ka continuity. Mynta shim ia u Condenser bad pyndei ia u sainer long jong u Meter ha uwei pat na ki khmat sainer jong u Condenser bad ia u sainer saw jong u Meter sha uwei pat u khmat sainer jong u Condenser. Nangta peit ia u jingkdew ha u Meter u khieh ne em, lada um khieh kata ka mut ba u Condenser u dang bha. Wat lada u khieh, hyprei u jingkdew jong u Meter suki suki u wan phai biang sha la ka jaka, kata ka mut ba u Condenser u dang bha. Bad lada u jingkdew ha u Meter u khieh bad um wan phai shuh sha la ka jaka kata ka mut ba u Condenser u la sniew. Da kane ka rukom thew lah ban thew tang ia ki Condenser kiba rit. Haba thew ia ki Condenser kiba heh pat, dei ban da pyniap shuwa ia ka ding kaba lang ha ki, da kaba pyniadei lang ia kito ki khmat sainer jong u Condenser. Nangta sa thew ia u kumba la kdew haneng, lada ym lah shuwa kumbe bad phi thew la ka thew, u Meter jong phi un sa sniew.

Hangne ruh haba thew ia ki Condenser kiba la pyn-dait ha ka Radio kynmaw ban da pyniap ia ka Radio bad da loit noh shuwa ia uwei u khmat jong u Condenser. Ha kajuh ka por ruh da pyniap shuwa ia ka voltage kaba lang ha u Condenser. Nangta sa lah ban thew ia ka continuity jong ki.

(iv) **Kaba thew ia ka voltage** :—Shuwa ban thew ia ka Voltage kaba don ha ka Radio, dei ban da tip ia kano ka jait Voltage kaba phi mut ban thew, la ka AC voltage ne DC Voltage,

Ha ka Electric Radio, ka AC voltage ka long naduh u plug haduh u Rectifier Valve imput. Kata ka mut naduh ba ka voltage ka rung ha u Rectifier valve ka long da ka AC voltage. Ha ki Filament jong kiwei kiwei ki valve ruh ka long da ka AC voltage Hynrei naduh u Rectifier valve haduh u output Transformer ka long da ka DC voltage. Kata ka mut ba naduh u Pin uba lai jong u Rectifier valve (Cathode Pin) haduh u output Transformer ka long da ka DC voltage.

Haba thew ia ka AC voltage u sainar iong jong u Meter u dei ban don ha ka thliw kaba thoh (—) lane Com. Bad ia u sainar uba saw pat lah ban bsuh ha ki thliw kiba dei tang ia ka AC voltage kiba la don lupa ha u Meter. Kine ki thliw ki don la ka jong ka jong ka voltage kaba sdang n/duh ka voltage kaba rit ter ter shaduh ka voltage kaba leh. Namar kata kaba dei ban kynmaw ka long ba, haba phi kwah ban thew ia ka voltage kaba 230 volts, ym dei ban sieh ia u sainar saw ha ka thliw kaba tang 10 volts. Lada leh kumne u Meter un sniew noh. Kaba dei ban sieh ia u sainar saw ka long ha ka thliw kaba 250 volts. Haba phi thew ia ka voltage kaba 6 volts pat, sieh ia u sainarsaw ha ka thliw kaba 10 volts, bad leh kumta ter ter.

Haba thew ia ka DC voltage u sainar iong u Meter u dei ban don ha ka thliw kaba thoh (—) lane com. Bad u sainar saw pat lah ban sieh ha ki thliw kiba dei tang ia

ka DC voltage kiba la don lupa ka jingthoh ha u Meter ha kine ki thliw ruh ki don ha la ki jong ki jong ki bor voltage kiba rit ter ter shaduh ka voltage kaba heh, hangne ruh dei ban kynmaw bha ba haba phi kwah ban thew ia ka voltage kaba 230 volts DC, ym dei ban sieh ia u sainar saw ha ka thliw kaba tang 10 volts, lada jia ba leh kumne u meter un sniew noh. Kumta dei ban sieh ia u sainar saw ha ka thliw kaba 250 volts DC. Kumjuh ruh lada phi kwah ban thaw ia ka DC Voltage kaba 9 volts DC sieh ia u sainar saw ha ka thliw kaba thoh 10 volta.

(Kane ka rukom ka iapher na uwei u jaid meter sha uwei pat. Don ki jaid meter kiba ia u sainar jong u meter ym ju weng ne pynkynriah kumba la kdew haneng. Ki don ki jingkhyrwait kiba lah ban pynkylla sha ki Ohms, sha ka AC voltage bad sha ka DC voltage).

(b) **Ka signal Generator** :—Kane ka jaid tiar ka long kaba ju pyndonkam ha kaba align ia ki IF transformer. Lada jia ba ki IF coil ki kynriah jaka da ka jingkhluud ka Radio, lane haba ki trai radio ki khyrwait ia ki Trimmer jong u IF transformer ne haba pyndait thymmal ia ki IF transformer haba kiba rim ki la sniew noh. Ka radio kam riew jam shuh kumta khnang ban ioh ia ka jingsawa kaba jam bad kaba paka la ju pyndonkam da kane ka tiar.

Haba align na ka radio kaba dei ban leh ka long ban pyndait ia u sainar iong jong ka signal generator sha ka chassis jong ka radio. Bad uwei pat u sainar saw jong ka signal generator sha u gang condenser. Kata ka mut sha ka jaka jong u condenser uba iadei bad u mixer signal grid.

Nangta khyrwait pynrit ia u gang condenser jong ka radio bad buh, ia u band ha u medtum wave band. Pynmeh ia ka Radio bad pynneh ia ka volume da kaba khyrwait ia u volume control.

Nangta phai pat sha ka signal generator. Khyrwait ia u jingkdew jong ka signal generator sha ka 455 lane 456 kilo cycles bad khyrwait ia u wave band sha u dak ba thoh 'A' lane wave band 'A'. Nangta pynheh ia ka signal generator bad pynheh ia ka volume da kaba kyrwait ia u volume control. Ynda ladep leh kumne sedang mynta ban khyrwait ia ki Trimmer jong ki IF transformer baroh lai tylli haduh ban da ioh ia ka jingsawa kaba jam na ka speaker.

Kaba dei ban kynmaw ka long haba khyrwait ia ki IF Trimmer ym dei ban khyrwait da ki screw driver nar. Dei ban pyndonkam da ki screw driver kiba la shua kyrpang tang ra ka bynta ban Align.

(Kane ka tester ka iapher na kawei ka jaid bad kawei pat. Namar kata haba thied ia ka, kynmaw ban da ia nujor bad kata ka jingbthah kumno ban pyndonkam ia ka).

(k) U Neen Tester :—Une u tiar u long kum u khulom ne screw driver uba rit. Da une la ju pyndonkam haba peit uno u sainer u bymdonding (Negetive) bad uno uba don ding (Positive) Lada don ding i bulb iba don ha une u tester in meh.

Kumta da une u tester ruh la ju bud dien ia u sainer positive na kawei ka jaka sha kawei pat, bad lada une u tester um pyni ding ha kaba buddien kumne kata ka mut ba u sainer u la dkut hapdeng.

La ju pyndonkam ruh da une u tester ha kaba peit ia ka jingleak ka current ha ka radio bad kiwei kiwei, kum ha ka electric iron, stove bad heater Haba pyndei da une u tester ia kano kano ka ohasis jong ka radio na ka met (body) jong kine kino ki tiar lada meh ding hapoh jong u. Kata ka mut ba ym bit ban ktaah 'ia kato ka tiar, lada ktaah lah ban shah lympat ei ha ka Electric current.

(d) **Ka Valve bad Transistor tester** :—Kane ka tester ka long kaba don kam bha ha kaba shna radio. Da kane ka tester lah ban tip tikna la u valve ne transistor u dang bha ne la sniew. Ka long kaba eh ban test da U meter ia ki valve ne transistor, haba test da u meter ki valve ki pyni kum kiba dang bha bad ynda la sieh ne pyndait ha ka radio kine ki valve lane transistor kim treikam shuh. Kumta la shem ba u meter um lah ban ai ia ka daw kaba paka ban tip ba ki valve ki transistor ki la sniew ne em.

Kumta haba thew ha une u tester ia ki valve bad ki transistor lah ban tip thikna ia ka voltage jong ki. Ha u valve, lah ban tip ia ka voltage jong u Plate, U Grid u Filament, u Cathode bad u Anode. Bad ha u Transistor pat lah ban tip ia ka voltage jong u Collector, U Base U U Emitter, kaba ki kjit bad kaba ki pynmih. Ha kajuh ka por lah ban tip ia ki valve ne ki transistor ki la sniew ne tlot bor (leak or weak) lyngba ka jingiarap ka valve date kata ba ia nujor ia ki voltage jong ki.

(Ia kane ka jait tiar ym lah ban batai hangne kumno ban pyndonkam ia ka. Namar ki rukom shna ki iapher na kawei ka jait bad kawei pat, kumta ha ka por thied ia ka, ka Company ka ju ai lang bad ka kot kaba batai kumno ban pyndonkam ia ka)

(e) **Ka signal Injector** :—Kane pat ka long kaba pyndonkam ha kaba buddien ia ka jingphah (signal) na kawei ka bynta sha sha kawei ka bynta jong ka Radio.

Pyndait ia u sainar (test lead) jong ka signal Injector uba dei jong ka ground sha ka chasis jong ka radio. Pynmsh ia ka signal injector bad ia ka radio. Nangta sa bud dien ia ka signal da uwei u sainar don ding (test lead) uba wan na ka signal injector. Ha kano ma kano ka bynta kaba phi pyndei da une u sainar ka speaker kan pah pip. Shu bñh mynta, lada phi bud dien ia ka signal na ki IF Transformer. Tang shu pyndei da une u sainar (test lead) ha uwei na ki pin jong u IF

**Transformer, ka speaker kan pah pip bad lada phi pyadei** sa ha uwei u pin ruh kan pah pip. Bad lada kam pah, kata ka mut ba uta u pin uba nyngkong uba pah pip tang shu pyndei, um don jingiadei (connection) bad uta uwei uba khlem pah. Hynrei ynda la ia nujor bad ka circuit diagram shem pynban ba ka pyni ba ki don ka jingiadei. Kata ka mut ba la don ka jingsniew ha uta u IF Transformer. Kumta da kane ka rukom lah ban bud dien ia ka signal ha kiwei kiwei ki bynta jong ka radio.

(g) **Ka circuit diagram** :—Kane ka long kaba batai kumno ka voltage ka iaid na kiwei ki tiar sha kiwei pat ki tiar kiba don ha ka radio.

Man la ki jaid radio ka don la ka jong ka Circuit Diagram kaba iapher na kawei sha kawei pat. Namar kata ban don ia ki circuit diagram ka long kaba donkam bha. ha kaba shna ia kino kino ki jaid radio. Ka jingdon jong kine ki circuit diagram ka iarap bha ha kaba buddien ia ka jingiaid ka voltage, na kiwei ki tiar sha kiwei ki tiar kiba don ha ka radio da kaba ia nujor bad kata ka circuit diagram kaba iadei bad kata ka jait radio.

(ng) **Ka Valve bad ka Transistor Data** :—Kane ka dei ka kot kaba batai shaphang ki voltage kiba iapher kiba don ha u valve bad ha u transistor. Bad ka long ruh ka kot kaba pyni ia ki jingia ryngkat bor jong ki valve para valve bad transistor para transistor.

(h) **Ki tiar trei** :—Ki tiar trei ki long kiba donkam bha ha kaba shna radio ne ha kaba trei ia kino kino ki jait kam, U nongtrei uba stad katno katno ruh haba um don ki tiar trei kiba iadei bad kata ka jait kam u long tang kum u tyngshop ha khmat kata ka jait kam. Te shuwa ban thied ia kino kino ki jait tiar trei dei ban da pyrkhath bha kino ki jait tiar trei ki long kiba donkam eh, bad kiba iadei bad kata ka jait kam, khnang ba kata ka jingpynlut pisa kan ym long kaba lehnehel.



Kine harum ki long ki jalt tlar trei kiba donkam eh ha kaba shna radio.

1. U nar kynthah pain electriot (Seldering Iron) uba 60 Watt bad uba 25 Watt.

2. Shi set ki screw driver 3. Kawei ka plast kaba jrong bad kawei kaba syndem khmut. 4. ka cutter. 5. Kawei ka kurat ot nar. 6. ka Drilling Machine bad shi set ki Drill. 7. Katto katne ki File rit. 8. Alignment screw driver set. 9 Kawei ka adjustable spaner. 10. Kawei ka Vise. 11. U soldar bad ka Flex resin.

(i) **Ki Spare Parts** :—Ki Spare Parts ki long kiba donkam bha ban don ha kaba shna Radio. Kine harum ki long katto katne ki spare parts kiba dei la kumno kumno ban don (a) Shiset ki valve kiba dei na ka bynta ka Transformer set bad shi set ki valve na ka bynta ka AC/DC set. (b) Katto katne ki Resistor kiba ha la ka jong ka jong ka bor kiba dei na ka bynta  $\frac{1}{2}$  watta (shiteng watts) bad 1 watts (shi watts). (k) Katto katne ki condenser ha la ki jong ki jong ki bor (d) Shi set ki Transistor (e) U Dial cords (ksai teh) (g) Katto katne ki volume control kiba 500K bad kiba 10K (ng) shi set ki IF Transformer na ka bynta ka AC/DC set (h) Katto katne ki output transformer na ka bynta baroh lai tylli ki jaid Radio (i) Katto katne ki Speaker ha la ka jong ka jong ka size ne jingheh.

## **KI JINGMAHAM BAD KI JINGAI JINGMUT**

Shuwa ban ktah ia kano kano ka radio dei ban tip kumno ban da husiar bha ialade bad kumno ban leh khnang ba ka radio kan ym sniew. Kine harum ki long ki jingbthah kumno ban ktah ia ka radio.

(a) U Nongshna radio u dei ban phong juti da ka juti jri lane da ka canvas, shuwa ban ktah ia kano kano ka radio, khnang ban iada ialade na kaba ioh shock kaba lah ban jia ha kano kano ka por.

(b) Dei ban don ka synduk buh dawai (First Aid Box) hajan khnang ba lada ka jia kano kano ka jingmynsaw lah ban ioh jingiarap shisyndon.

(k) Shuwa ban ktah ia kano kano ka radio kaba meh, dei ban da peit ne thew da u Nion tester. Lada ka chasis ka don ding u nion tester un meh ding hapoh jong u namar kata ym dei ban ktah ia ka baloh shu ioh shock ei.

## **KI JINGAI JINGMUT**

(a) Ka jaka treikam kam dei ban long kaba sngem namar ka current ka ju leak khah khah kum ha kine ki jaka. Kumta khnang ban lait na ka jingma ka kamra trei ka dei ban long kaba rykhiang bha.

(b) Ia ka jaka trei dei ban da siang da ka shylliah jri khnang ba lada ioh shock, kan ym long kaba jur

(k) Ka current kaba leit sha ka jaka trei ka dei ban iaid lyngba ka Steplizer khnang ban iada na ka voltage kaba kiew bad kaba hiar.

(d) U Fuse ha ka jaka trei um dei ban long lang bad jong ka ling dei ban don la u jong u fuse, ba ynda haba ka short ka radio ka ling baroh kawei kan ym lip, hynrei kan lip tang ka jaka trei.

(e) Ka jaka trai ka dei ban don ka earthing haba paka khnang ban lait na ka ba ioh shock kaba jur.

(g) Haba teh ia u Arial kynmaw ban teh sha ka bynta shatei bad shathie ym dei ban teh sha mihngi-sepngi. Lada teh na mihngi-sepngi. Ki station kin ym sawa bha, khamtam kito ki station kiba na sha jngai.

Kine harum ki long ki katto katne ki jingbthah, kumno ban leh shuwa ban ktah ia ka radio :—

(a) Shuwa ban loit ia ka jingkeh jong ka radio, kynmaw ba ka radio kam dei ban meh. Lada ka meh pynlip shuwa ia ka.

(b) Haba kynthah pain ia kino kino ki bynta kiba don hapoh ka chasis jong ka radio da pynlip shuwa ia ka radio, khnang ban ym sniew ei ki tiar kiba don hapoh ka chasis jong ka radio.

(k) Wat ju sei ne pyndait ia kino kino ki valve khlem da pynlip shuwa ia ka radio. Da kaba leh kumne ki valve ki lah ban sniew ei lada jia ba kum bakla.

(d) Wat ju thew ia ka continuity ia kino kino ki tiar ha ka por ba ka radio ka meh. Lada leh kumne u meter un sniew noh shisyndon.

**KA TRANSISTOR RADIO :** Kane ka jaid radio ka long kaba thut shen bha haduh katta katta. Tang shu la ktah kulmar ia ka, ka la sniew noh khlem da tip ei ei, Kumta haba ktah ia kane ka jait radio dei ban kynmaw ba :—

(a) Tang shu la rung jingkhuid sha u transistor kata un sniew noh. Wat tang da ka jingkhuid jong u Soldering iron ruh lah ban pynsniew ia u, namar kata ; haba kynthah pain ia u transistor dei ban da bat da ka plast kaba jrong na ki kjat jong u khmut khnang ba ka jingkhuid kan ym ioh rung sha u transistor. Bad ka rukom kynthah pain ruh ka dei ban long kaba kloi bha.

(b) Ym dei ban kynthah pain ne weng ia kino kino ki tiar ha ka por ba ka radio ka dang meh. Khamtam ia u transistor.

(k) Haba wad ia ka signal kynmaw ba ym dei ban pyniashort ia u Transistor Electrode sha ka chasis lane kaba ngi ong ka ground. Da kaba leh kumne u Transistor un sniew noh.

(d) Wat ju thew ia ka continuity jong u Transistor ha ka por ba ka radio ka meh. Lada leh kumne u Transistor un sniew bad u ~~corner~~ ruh u lah ban sniew

(e) Ym dei pan pyndonkam da u Soldering iron u ba heh voltage haba trei ia kane ~~Qkane~~ ka jaid radio. Lada pyndonkam da une ka radio kan sniew noh. Kumta khnang ban lait na kane ka jingma, dei ban pyndonkam da u Soldering iron uba naduh 25 watts sharum.

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## KA LYNNONG KABA NYNGKONG

### KA RADIO KA BYM RIEW EI EI

Ha kane ka lynnong ngin ia kren shaphang ka jingsniew jong ka radio. Kiei ki daw kiba pynlong ia ka ba kan sniew, bad kumno dei ban leh khnang ba kan bha pat. Ha kaba nyngkong ngin ia kren shuwa ia ka radio ka bym don jingriew ei ei ha ka speaker lane bym don jing-meh ha ki volve bad dial lamp.

Shuwa ban ktah ia kano kano ka radio dei ban da tip kaba kumno ka jaid radio ka long. Ka dei ka Transformer set AC lane ka AC/DC set ne ka Transistor set. Ynda la tip ba ka dei ka jaid set aju, nangta sa plied ia ka circuit diagram kaba iadei bad kata ka jaid radio, khnang ban lah ban ianujor ia ka jingiaid ka circuit.

### KA TRANSFORMER SET NE KA AC SET

Kum kane ka jaid jingsniew ha kane ka transformer set, kaba nyngkong kaba dei ban suba ka long u plug. Shim ia u plug ka radio bad thew ia ka continuity jong u da u meter na kito ki pin jong u (Ia ka rukom thew la lah bthah ha ka jingkdew lamphrang). Katba nangthaw kumne pynkhih ia u switch da kaba pynmeh pynlip ia u. Lada u meter um pyni continuity ne resistance ei ei, plied ia ka jingtap jong u plug ioh ba ki sainar kiba pyndaidd ha u ki lait ne dkut. Pynbha ia kito ki sainar lada shem ba ki lait ne dkut. Hynrei lada shem ia kine ba ki bha, pyndait noh ia kata ka jingtap jong u plug. Nangta loit ia ka jingkah jong ka radio kaba shadien bad sei ia ka chasis shabar, khnang ban kham suk ha kaba wad ia ka jingsniew kaba don ha ka. Kaba bha ka long ban pynthiah da khongpong ia ka chasis. Teh shuwa ia kito ki pin jong u plug da ki sainar lyngkhuid. Sei noh ia u fuse jong ka radio shabar. Nangta sa thew ia ka continuity jong kine ki sainar kiba wan na u plug na kawel pat ka tduh. Lada u

meter um pyni continuity ei ei, kata ka mut ba u sainer na u plug haduh kata ka jaka kaba la thew u la sniew. Loit noh ia une u sainer bad pyndait da u sainer uba thymmai.

Lada kine ki sainer ki bha, phai mynta sha u fuse bad u switch. Thew ia ka continuity jong kine baroh ar na kito ki pin kiba mih na ki. Lada kim pyni continuity, kata ka mut ba ki lah sniew. Loit noh ia kito kiba la sniew bad pyndait noh da kiwei kiba bha. Hynrei haba shem ba kitei kiba la pyni haneng ki bha, phai mynta sa sha u power Transformer. Thew ia ka continuity ne resistance ka don ne em. Lada um pyni ei ei, kata ka mut uta u coil primary u la sniew. Ha kajuh ka por, peit ia u Power Transformer la u don dak ing ne em. Lada u la ing weng noh ia u na ka circuit bad pyndait da uwei uba thymmai uba dei ujuh u jait bad uto uba la sniew. Hynrei lada u power Transformer u bha, u pyni ia ka continuity bad ia ka resistance kaba heh. Teng teng la ju shem ba u Power Transformer u pyni continuity hynrei um pyni ia ka resistance. Kuanta ym dei ban shim ba u dang bha, hynrei ka dei ba u Power Transformer u la sniew ba short.

Ynda la dep thew da u meter shem ba u Power Transformer u bha, phai mynta sha ki sainer Secondary jong une u Transformer. Sleh ia u plug jong ka radio ha ka plug. Pynmeh ia ka radio, nangta pynkylla ia u meter sha ka AC voltage kaba 10 volts, bad sa thew ia ka Filament voltage kaba mih la u Power Transformer. Kane ka voltage ka long 6 volts. Lada shem ba u meter um pyni voltage ei ei, kata ka mut ba ki sainer ki la dkut ne lait na ki jaka ba la kynthah pain. Pynbha ia kine ki sainer da kaba pyndait pain biang bad thew biang ia ka voltage jong ki. Ynda u meter u pyni ba ka don ka voltage, peit la baroh ki valve ki meh ne em. Lada shem ba baroh ki valve kim meh. Pynkhih ia ki valve ki bym meh da ka kti khnang ba ki pin jong ki valve ki bym ia tyngkhuh bha bad kite ki pin jong u socket kin ia tyngkhuh bha. Wat ynda ia lah ketne ruh kim meh, pyn-

lipahuwa ia ka radio. Sa thew ia ka continuity jong ki Filament kiba don ha ki valve, da kaba sei uwei hadien uwei u valve na ka socket. Lada shem ba ki valve miri pyni continuity haba thew ia ki Filament jong ki, kata ka mut ba ki valve ki la sniew. Haba sei ia ki valve shabar na ki socket ym dei ban sei lut ia ki valve baroh ha kajuh ka por ba ioh shu jia kumno re kumno ba bakla ban thep biang ha ka jaka kaba uta u valve u dei ban don. Lada kum bakla thep kumne ka radio kan sniew noh bad ki valve ruh kin sniew. Kumta dei ban da phikir bha na kane ka bynta. Kaba dei ban leh ka long ban sei uwei u valve, nangta thew ia u da u meter bad ynda la dep thew lada shem ba u bha thep biang ha ka jaka kaba la sei ia u. Nangta sa sei sa uwei pat bad kumta ter ter. Lada shem ba ki valve ki la sniew pyndait noh da kiba thymmai. Ynda la pyndait da kiwei pynmeh ia ka radio, bad peit ia ki valve la ki la meh ne em. Hoold da shisha ki valve kin meh.

Teng teng la ju shem ba shuwa ba ki trai radio kin wan phah shna ia la ki jong ki radio ki da kaulia shuwa da lade ia ka set, kum kaba sei kai ia ki valve bad kiwei kiwei. Hynrei ynda ki la pyrehang ban sieh biang ia ki ki la bakla jaka ban sieh ha ka jaka kaba uta u valve u dei ban don. Kumta shuwa ban pynmeh ia ka radio dei ban da peit bha ia kane loh ba ka radio kan sniew ar shah. Lada shem jingeh haba sieh ia ki valve shim ia ka kot kaba batai ia kata ka circuit diagram. Bad ia ki sainer jong ki Filament ha kane ka jaid set ka long kumba pyndait jingkieng (Parallel connection).

### KA AC/DC SET

Kane ka set wat la ka long ka Electric set kumba long ka AC set, ka iapher ha la ka jinglong jong ka. Kaba nyngkong ka jinglapher ka long ba ka rukom pyndait ia ki sainer (Filament circuit) kam long kum ka jong ka Transformer set, hynrei ka long kumba teh kasi lyngkhet na uwei u pin jong u valve sha uwei pat u valve bad u wan pawl ban ter sa na uwei pat u pin. Kumta

lada uwei u valve um meh kata baroh ki valve kin ym meh. Kaba ar ka long ba kane ka jaid set kam don power Transformer kumba long ka AC set. Ha ka jaka jong u Transformer la donkam da u main Resistor.

Haba trei kum kine ki jaid set, dei ban da sumar bla, namar ba uwei u sainar u leit iasoh bad ka chasis jong ka radio. Kumta haba kwah ban ktah ia kane ka radio, ha ka por ba ka meh, dei ban da thew da U Neon tester ba ioh ka chasis jong ka radio ka don ding. Lada don ding ha ka chasis, U Neon tester um pynl dak hapoh jong u da kaba i meh i Bulb Pynkylla noh ia u plug jong ka radio da khongpong bad sa sieh biang ha ka plug. Thew biang da u Neon tester la ka chasis ka dang don ding ne em. Lada u Neon tester u pyni ba ym don ding shuh, kata ka mut ba la long ban trei ia ka. Haba sieh ia u plug da khongpong kumba la ong haneng ka chasis kam don ding shuh.

Kynmaw namar kata, ban buh dak~~ia~~ia u plug bad ban leh kumjuh hadien habud.

Shim ia u plug jong ka radio, thew ia ka continuity jong ki da u meter na kino ki pin kiba mih na u. Nangta pynmeh pynlip ia ka radio Peit la u meter u pyni continuity ne em. Ia ka rukom thew leh kumba la bthah ha ka jingkdew lamphrang. Lada ym don continuity. loit ia ka jingtap jong u plug bad peit ba ioh ki sainar kiba pyndait ha ki pin jong u plug ki lait. Haba don ka jinglait pynbha ia ki. Ynda la dep pyndait ia kita kiba lait sa thep biang ia ka jingtap jong u plug. Nangta sa thew biang ia ka continuity la ka don ne em. Lada em phai mynta sha ka radio. Loit shuwa ia kata ka jingkah kaba na shadien jong ka radio bad sei ia ka chasis shabar. Teh ia ki pin jong u plug da ki sainar lyngkhuid nangta thew ia ka continuity jong une u sainar ha kawei pat ka tduh. Lada u meter um pyni continuity kata ka mut ba u sainar u la dkut napdeng. Weng noh ia u bad ha ka jaka jong une u barim pyndait noh da uba thymmai. Hyarei haba kine ki bha phai mynta sha u fuse bad u



switch. Thew ia ka continuity jong ki na kito ki pin jong ki bad lada shem ba ki la sniew, pyndait noh da kiba thymmai ha ka jaka jong kite kiba la sniew.

Wat la pyrshang haduh katne, hynrei ym shym tap jingsniew ei ei satia, phai noh mynta sha u power Resistor. Thew ia ka continuity jong u. Bad shuwa ban thew sei noh shuwa ia u Rectifier Valve na ka Circuit bad thew pat ia ka continuity jong u. Lada u Power Resistor u pyni ia ka continuity bad Resistance, kata ka mut ba u dang bha.

Mynta ngin poi sha ki valve. Thew ia ka continuity jong ki Filament baroh kiba don ha ki valve bad kito ki Dial lamp bad ia kito ki Resistor kiba la pyndait ha ki. Lada shem ba uwei pa kita um pyni continuity kata ka mut ba la lap ia ka jingsniew. Ha ka jaka uta uba la sniew pyndait noh da uba ia ryngkat kajuh ka bor bad uta uba la sniew.

La ju shem bunsien ba haba u Condenser uba pyndait na u sucket jong u Rectifier Valve sha ka chasis u sniew (short,) u ju pynsniew ia ki Filament jong u Rectifier Valve, kumta shuwa ban thep da uwei u Rectifier Valve uba thymmai da pynbha shuwa ia u condenser. Weng ia uwei u khmat jong une u condenser na ka circuit bad thew da u meter ia ka continuity jong u. Lada u pyni ia ka continuity khlem da wan phai shuh sha la ka jaka, kata ka mut ba une u condenser u la sniew. Weng noh ia une u condenser ba la sniew bad pyndait noh da uwei uba dang bha uba ia ryngkat ka juh ka bor bad uta uba la sniew. Kaba dei ban kynmaw bha ka long ba shuwa ban pynmeh ia ka radio, dei ban da peit bha ia kane ka bynta jong u condenser. Lada tang shu bakla u Rectifier Valve uba thymmai un sniew biang.

Nangta pynmeh ia ka radio, peit ia ki valve ki meh ne em. Lada kim meh pynkhih da ka kti ia ki valve, khnang ba ki pin jong ki valve kin ia tyngkhuu bha bad kito ki pin jong ka sucket. Kumta da kaba leh kumne ki valve baroh kin meh.

## KA TRANSISTOR SET.

Shuwa ban ia kren ia kane ka jaid set, ngin ia kren shuwa ia ka Eliminator. Une u jaid tier u long uba pynkylla ding voltage na ka 230 voltage AC sha ka 9 volts. ka 6 volts ka 3 volts bad sha ka 1.5 volts DC. Da une la ju pyndonkam ha kane ka jaid radio, ha ka jaka ki Batery, Kumto khnang ban lait na kaba thied Batery man la ka jaid radio bad ruh ha ki voltage bad ki size kiba ia pher, ka la bha shibun ban pyndonkam da une u jaid tier.

Ka Transistor radio ka iapher bak-lbak na kito ki ar jaid ki Radio Set kiba la pyni shakhmat. Kine harum ki long ki jingpyni ia ka jingiapher jong ki.

Kaba nyngkong ka jingiapher ka long ba, ha kito ki jait set AC bad AC/DC lah ban iohi ia ka jingmeh ki valve Hynrei ha kane ka jait set pat um lah ban iohi ia ka jingmeh jong ki valve. Namar ba ha ka jaka ki valve la pyndonkam da ki Transistor.

Kaba ar ka jingiapher ka long ba ha kito ki set kiba la pyni sha khmat la pyndonkam da ka Electric current kaba 230 volts AC. Hynrei ha kane ka jait set la pyndonkam da ka Dry Battery kaba tang 9 volts DC sharum.

Kaba lai pat ka long ba kito ki set tang shu la bakla la shah bat ne shah lympat ha ka Electric. Hynrei ha kane ka jait set pat ym don eiei kum kata ka jingma.

Mynta ngin phai noh sa sha ka Transistor Radio. Ha-ba trei kum ia kane ka jait set, kaba nyngkong ka long ban peit katno kata ka jait set ka donkam ia ka voltage. Lada ka donkam 9 volts DC pynkylla da kaba khyrwait ia u jingkhyrwait uba don ha u Eliminator sha ka 9 volts DC, khnang ban lah ban ai iaka voltage kaba biang kat kum ka jingdon kam jong kata ka set. Lada ka set ka donkam 1.5 volts DC pynkylla ia u Eliminator da kaba khyrwait na u jingkhyrwait jong u sha ka 1.5 DC Kumta da kane ka rukom lah ban lah ia ki 6, 8, volts bad

kumta ter ter kat kum ka jingdonkam jong ka jait set. Peit bha ia kane ka jingbtah ba kan ym bakla. Lada kum ai ka voltage kaba kham heh ha ka jaka kaba rit eh, ka set ka lah ban sniew shuh shuh, ban ia kaei kaba ka long mynshuwa.

Sieh ia u plug jong u Eliminator ha ka plug. Nangta pyndait ia ki sainer kiba mih na u Eliminator sha ka Transistor Radio. Ia u sainer long sha ka Negative bad ia u ba saw pat sha ka Positive. Haba pyndait kumne kynmaw ban da peit bha khnang ba kan ym don jingpyndait da khongpong. Lada kum pyndait da khongpong ia kine ki sainer ka radio kan ym riew kumba ka dei ban riew hynrei kan shu pah kulmar.

Ynda la biang ka jingpyndait baroh, pynmeh ia u Eliminator bad ia ka radio. Nangta sngap la ka la wan ne em ka jingriew klik na ka speaker. Lada em, pynkhuid ia ki jingiatyngkhuh (Contact) jong kito ki jaka kiba pyndait Battery bad ia u spring. Haba kitai ki bha lut baroh, thew ia ka continuity jong u switch da u meter. Lada um pyni continuity kata ka mut ba u switch u la sniew. Weng noh ia u na ka circuit bad pyndait noh da uba thymmai uba ia ryngkat ka juh ka bor bad uta uba la sniew.

Wat ynda la dep pyndait da uwei u switch thymmai ruh ka radio kam man riew satia. Te kaba dei ban leh pat ka long ban thew ia ka voltage la ka la wan ne em sha ka radio. Shim ia u sainer Saw (Positive) jong u Meter pyndait ha ka chasis jong ka radio bad ia u sainer long (Negative) pat wad ia ka voltage da kaba pyndei ha ki bynta jong ka Negative line kiba don ha ka radio. Nangta peit ia u jingkdew ha u meter la u pyni voltage ne em. Lada em, kata ka mut ba ki sainer kiba wan na ka Battery sha ka radio ki la sniew. Pynbha ia kito ki sainer bad sa thew biang ia ka Voltage te phin shem ba ka voltage ka la wan.

Ka juh jia bunsien ba ki trai radio ki ju lulia ia ka radio bad ki pyndait kulmar ia kino kino ki sainer ba la dkut khamtam ia kito ki sainer kiba wan na ka Battery

sha ka radio. Kumta da kane ka jingleh jong ki la pyn-  
long ia ka radio ba kan ym riew. Dei ban da peit bha ia  
kane ka bynta.

Haba ki trai radio ki wan rah ia ki radio sha ki nong-  
shna lem bad ki Battery, kaba nyngkong kaba dei ban peit  
ka long ia ki Battery la lehse ki la duna voltage. Ka  
jingduna voltage ruh ka juh wan rah ia kane ka jait jing-  
sniew. Lada shem ba ki Battery ki la duna voltage weng  
noh ia ki bad thep noh da kiwei kiba thymmaï.

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## KA LYNNONG KA BA AR

### KA RADIO KABA DON KA DING HYNREI KAM DON JINGRIEW EI EI

Ha kane ka lynnong ngin ia kren ia ka radio kaba meh lut ki valve bad ki Dial lamp, hynrei kam don jingriew eiei ha ka speaker. Ki daw kiba kongsan kiba lah ban pynlong kumne ki long (1) Ba la sniew ka speaker. (2) Ba la sniew ka bynta jong ka output (output stage). (3) Ba la sniew u Output Transformer. (4) Ba u Rectifier valve u la sniew.

### TRANSFORMER SET

Haba shna ia kum kine ki jait set, plied shuwa ia ka jingka kaba da shadien jong ka radio. Nangta sa pyn meh ia ka radio. Peit la baroh ki valve ki meh ne em, khamtam eh ia u Rectifier valve bad u Output valve. Lada kine kin meh, pynlip ia ka Radio bad sei ia kine ki valve shabar ha ka circuit. Thew ia ka continuity jong ki valve da u meter. Lada kim pyni continuity kata ka mut ba ki la sniew. Pyndait noh da kiba thymmai ha ka jaka kita kiba la sniew. Sngap ia ka radio ka la wan jingsawa ne em na ka speaker ynda la pynmeh ia ka.

Lada kam wan jingsawa eiei, kata la donkam ban peit ia ka speaker. Weng noh shuwa ia kito ki sainar kiba pyndait ha ka speaker bad u Output Transformer. Nangta thew ia ka continuity jong ka speaker. Lada kam don continuity kata ka mut ba ka speaker ka la sniew. Pynbha ia ka, ia ka rukom pynbha ia ka speaker la bthah ha ka lynnong kaba shadien, hynrei lada ym lah pynbha shuh pyndait noh da kaba thymmai.

Wat ynda la dep leh kumne shem ba baroh ki bha lut hynrei ka radio kam man rwai satla, te kaba dei ban peit ka long ia u Output Transformer. Sei noh shuwa ia u output valve, nangta thew ia ka continuity da u meter ia ki sainar primary jong u output Transformer. Lada ki

pyni ia ka continuity bad ia ka Ohms kaba hagdeng jong ka 200 ohms bad 1000 Ohms, kata ka mut ba u sainar primary jong u output Transformer u dang bha. Ka juh jia teng teng ba u sainar primary jong u Output Transformer u pyni continuity hynrei um pyni Ohms ei ei. Kata ka mut ba u Output Transformer u la sniew ne short. Weng noh ia une u Transformer na ka circuit bad ha ka jaka jong u pyndait noh da uwei uba thymmai.

Hadien ba la leh katne ruh ka radio kam man riew satia te la dei ban phai sa sha. ki valve. Pynmeh ia ka Radio bad thew ia ka DC voltage jong u Rectifier valve. Pyndait ia u sainar iong jong u Meter ha ka chasis jong ka radio bad ia u sainar saw pat sha u pin uba lai lane Cathode pin jong u Rectifier valve. Lada um pyni eiei, laha ban suda ba u valve u la sniew. Sei noh ia u bad pyndait noh da uba thymmai. Shuwa ban leh kumne da peit shuwa ioh don ki sainar kiba wan na u Power Transformer ki lait ne khlem pyndait pain bha (loose connection) ha ki pin jong ka sucket. Lada ka long kumta. pynbha ia ki. Ka juh jia lada u Rectifier valve u pyni ia ka output voltage kaba palat ban ia kaei kaei kaba dei ban long, kata ka mut ba u Filter Resistor u la sniew. Weng noh ia une u Resistor na ka circuit bad pyndait da uba dang bha uba dei ka juh ka bor bad uta uba la sniew. Teng teng ruh la juh shem ba wat ia u Rectifier valve u pyni ia ka output voltage, hynrei kane ka voltage ka duna na kaei kaba ka dei ban don. Kumta lah ban suba ba u Condenser uba don hagdeng jong u Retifier filament bad u output transformer uba pyndait ha u pin jong u Serene uba don ha u output valve u la sniew. Loit noh ia u bad pyndait da uba thymmai uba dei ka juh ka bor bad uta uba la sniew.

Lada kitei kiba la kdew haneng ki bha lut baroh, kaba. dei ban suba mynta ka long ia u output valve. Lada ka voltage kaba leit sha une u valve kam biang ia u ba un trei. kam, une u valve u kylla long u bym lar kam. Kumta. thew ia ka voltage kaba wan sha u, bad kaba mih na u da. kaba ia nujor bad ka valve Data. Lada ka Negative vol-

tage ka long bun (high) kata ka mut ba u Resistor uba pyndait ha u u la sniew. Loit noh ia kine ki Resistor bad pyndait da kiba thymmai, kiba dei ka juh ka bor bad kito kiba la sniew Ynda la dep leh kumne ka radio kan sa wan ka jingrwai.

## KA AC/DC SET

Haba trei ia kane ka jait set, ka circuit diagram bad ka valve data ka dei ban don hajan khnang ban lah ban ia nujor ia ka circuit bad ia ka voltage kaba don ha ka radio.

Sei ia ka chasis shabar, khnang ban ioh ban thew<sup>1</sup> ne trei ia ki tiar kiba don shapoh. Mynta sd ang ban thew ia ka continuity bad ia ka resistance jong u Power Resistor. Ka Filament Resistance ka dei bandon hagdeng 950 Ohms bad 1000 Ohms. Ka Plate Resistance prt ka dei ban don hagdeng 150 Ohms bad 300 Ohms Lada ka continuity ha u Resistor kaba dei ia ka plate kam pyni eiei, kata ka mut ba une u Resistor u la sniew. Weng noh ia une na ka circuit bad pyndait noh da uba thymmai, lane khnang ban pynduna ia ka jinglut lah ban pyndait da u Resistor uba rit halor jong une u Resistor uba la sniew namar ba u Filament Resistor u dang bha.

Lada u tei u Power Resistor uba la kdew hanng u dang bha, thew pat ia u Resistor uba pyndait hagdeng u Electrolictic Condenser. Haba une u la sniew u juh wan-rah ia kane ka jait jingsniew. Weng noh ia u, lada u la sniew bad pyndait da uba bha uba don kajuh ka bor bad uto uba la sniew.

Pynmeh ia ka radio bad sngap la ka don jingriew ne em ha ka speaker. Lada kam don loit ia kita ki sasar kiba pyndait ha ka speaker. Naugta thew ia ka continuity jong ka speaker da u meter bad lada shem ba ka la sniew, pyndait noh da kaba thymmai. Ia ka rukom pynbha ia ka speaker leh kumba la bthah ha ka lynnong kaba shadien.

Ynda la dep leh kumne, shem ba baroh ki bha lut hynrei ka Radio kam man riew satia. Kaba dei ban peit ka long ia u Output Transformer. Shwa ban thew ia ka continuity jong u da u meter sei noh shwa ia u Output Valve na ka circuit. Nangta sa thew ia ka continuity jong u saina primary jong u Output Transformer. Lada u pyni ia ka continuity bad ka Ohms kaba hagdeng jong ka 200 bad 1000 Ohms, kata ka mut ba u dang bha. Hynrei lada pyni tang ia ka continuity kata ka mut ba u la sniew ne short. Weng noh ia u Output Transformer ba la sniew bad pyndait da uwei uba thymmai uba dei ka juh ka bor bad uba la sniew.

Hadien ba la leh katne ruh lada ka radio kam man riew satia te la dei ban phai sha ki valve. Ia ka rukom ban leh leh hi kumjuh kumba la batai ha ka AC set.

## KA TRANSISTOR SET

Ha kane ka jait set ki daw kiba lah ban pynlong ba kan ym riew ki long kumne. (1) Ba la sniew ka speaker (2) Ba ki contact ha ka bynta jong ka earphone ki la sniew (3) Ba ki saina ki la jait ne dkat na ka circuit (4) Ba u Output Transformer u la sniew.

Loit shwa ia ki saina kiba pyndait na u Output Transformer sha ki Speaker. Sa thew ia ka continuity jong ka speaker. Lada u meter um pyni continuity kata ka mut ba ka la sniew. Loit noh ia ka speaker bad pyndait da kaba thymmai kaba ia ryngkat ka juh ka Ohms bad kaba rim.

Teng teng ki trai Radio haba ki pyndonkam ia ka Earphone, ki jingpyndei (contact) ki sniew noh da kaba kynriah na kaba ia contact bad kin contact shuh. Namar kata ka jingwai kam wan shuh ha ka speaker. Pynbha shwa ia kine ki contact da kaba pyndonkam da ka nap kaba nap khmut khnang ba ki contact kin ia tyngkhuu biang. Thew da u Meter ia kine ki contact lada ki pyni continuity kata ki contact ki la bha.



Peit bha ruh ba ioh ki sainar ki lait ne dkut hangno re hangno namer ba ki juh lait kha kha khamtam ha kito ki radio kiba rit Da ka jingdut jong kine ki sainar ki pynfong ia ka Radio ba kan ym riew.

Thew ia ka continuity jong u Secondary (sainar) jong u Output Transformer da kaba weng shwa ia uwei u kjat jong u na ka circuit La juh shem ba une u sainar u juh lait haba ki trai Radio ki thep Battery ne lufia ia ka. Lada um pyni continuity weng noh ia u bad pyndait noh da uwei uba dei ka juh ka bor bad uta uba rim.

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## KA LYNNONG KA BA LAI

TANG KA JINGPAH LAH BAN IOHSGEW HYNREI  
YM DON JINGRWAI EI EI.

Kum ha kane ka jait Radio lah ban suba ba la don jingsniew ha ki (1) Osilator Circuit. (2) If Transformer. (3) Gang Condenser. (4) bad Trimmer.

### KA TRANSFORMER SET

Ha kane ka jait radio peit shuwa, uno u valve u ba troi ia ka kam Osilator. Nangta thew ia ka voltage jong une u valve da u Meter sa ia nujor ia ka voltage bad ka valve Data khnang ban tip la ka voltage ka biang ne em. Kaba dei ban peit bniah ka long ia ka Negative voltage jong une u valve. Ka rukom ban thew ka long hi kumjuh kumba la bthah ha ki lynnong kiba sha khmat. Lada ka voltage kam biang pynlip ia ka radio bad thew ia ka continuity jong ki resistor jong kane ka circuit bad peit ia ka resistance ba ki dei ban don. Bad lada kim don continuity bad kim pyni ia ka resistance, ka ba dei ban leh ka long ban weng noh ia ki na ka circuit bad pyndait noh da kiwei kiba bha kiba don hi ka juh ka bor bad kito kiba la sniew. Lada ym lah ban tip shuh ia ka bor jong ki wad jingiarap da kaba ia nujor bad ka circuit diagram.

Thew ruh ia ki condenser da u Meter ia kito kiba dei ha ka circuit la ki dang bha ne em. Ia ka rukom ban thew leh kumba la btah ha ki lynnong kiba sha khmat. Lada ki la sniew weng noh ia ki na ka circuit bad pyndait da ki ba thymmai kiba don ka juh ka bor bad kito kiba la sniew. Ynda la dep leh kumne, pynmeh ia ka radio bad sngapthuh ia ka jingriew jong ka. Lada kam wan jingrwai ei ei ruh, pynlip ia ka radio bad sei noh ia uto u valve bad pyndait noh da uwei uba thymmai. Nangta pynmeh biang ia ka radio bad lada ka wan jingrwai kata ka mut ba u valve u ba la sei u la sniew. Hynrei lada kam wan jingrwai kata ka mut ba la don ka jingsniew sha kawei pat ka bynta.

Phai mynta mynta sa sha ki Osilator Coil da la nujor bad ka circuit diagram ia ka jingiaid ka circuit. Thew ia ka continuity jong kine ki coil da kaba weng shuwa ia kito ki sarnar kiba ia pyndait bad ki. Lada kim pyni continuity ei ei, sei noh ia ki shuwa na ka circuit bad pynbha ia ki. Ynda ki la bha pyndait biang ia ki. Ka juh jia bunsien ba kine ki Coil ki juh dkut lane kim ia dait bha ha ka por ba kynthah pain. Bad ki pynlong ia ka radio ba kan ym riew. Pynbha ia kine kiba la sniew bad kynthah pain ia ki.

Ynda ladep leh kumne, shem ba ki Coil ki bha lut baroh. Phai mynta sa sha u Rectifier Valve. Thew da u Meter ia ka Output voltage jong u, la ka biang ne em da kaba ia nujor bad ka valve Data. Lada ka biang, bud dien ter ter ia kane ka voltage shaduh ka osilation. Hynrei lada ka voltage ka hiar ne rit kynsan haba ka poi ha kane ka circuit, kata ka mut ba la sniew u resistor. Loit ia uta u resistor uba la sniew bad pyndait da uba thymmai uba ia ryngkat bor bad uba rim. La juh lap bunsien ba haba kine ki resistor ki la sniew, ki kylla rong bad ki don dak ing ha ka met jong ki.

Lada kine ki resistor kim pat sniew, phai mynta sa sha ki Condenser, thew ia ka continuity jong ki Condenser baroh kiba don hapdeng u Rectifier valve haduh kane ka circuit. Ka rukom thew leh kumba la batai ha ki lynnong kiba shakhmat. Bad haba thew da ka voltage ia kine ki condenser da ia nujor bad ka valve Data. Lada ka voltage ka pyni duna than ha ka jaka ba don u Condenser, kata ka mut ba u Condenser u la sniew (leak). Loit noh ia uta uba la sniew bad pyndait da uwei uba dang bha uba don ka juh ka bor bad uba la sniew.

Haba kine kiba la kdew haneng baroh ki bha, peit mynta sa sha u Electrolytic Condenser. Haba thew ia ka Ohms, u pyni kum uba dang bha, bad ynda la pynmeh ia ka radio um trei kam shuh bad u pyni ia ka voltage kaba rit. Kumta la dei ban suba ba u la sniew, ba u la don jingpher ha kaba pyni ia ka voltage. Sei noh ia u shabar bad pyndait da uwei uba bha uba dei kajuh ka bor bad uba la sniew.

La juh shem ba haba ki Trimmer ki sniew ne iatyang-  
khuh da ka jingkyriah jaka ka mica ne da ka jingkdor  
jong kito ki tin haba ki traf radio ki lulia, ka juh wanrah  
ia kane ka jait jingsniew. Pynbha ia kito ki tin kiba la  
kdor bad ia kito kiba ia tyngkhuh da kaba buh da kawei  
pat ka mica hapdeng jong ki. Kine ki Trimmer kim dei  
ban pyni ia ka continuity, hynrei ki lah ban pyni ia ka  
Ohms kaba heh kum I Meg shaneng. Haba thew ia kine  
da weng noh shuwa ia ki sainar kiba la pyndait ia ki  
Trimmer.

Ka juh jia ruh bunsien ba, shuwa ba ki traif Radio kin  
wanrah ia ka Radio sha ki nongshua ki da lulia hi ia ka  
Radio khleg da tip ef ei ba ki la pynkyrtang ia kito  
tin jong u Gang Condenser. Ynda ki pynmeh ia ka Radio  
ki shem ba ham wan jingrwai shuh bad ka shu riew khred  
khred haba ki wad station. Kumta haba u Gang Conden-  
ser u ia tyngkhuh, ka jingrwai ka jah noh. Pynbeit ia  
kane ka jingia tyngkhuh da kaba khyrwait na u Sorew  
pha don ha un u Gang Condenser Ynda la dep pynbeit  
ia kane ka jingia tyngkhuh ka jingrwai kan sa wan

Ka juh jia ynda la pynbeit kumne ruh ka dang don  
hateng hateng ka jingpah khred khred, kata ka mut ba  
dang don jingia tyngkhuh jong ki tin ha u Gang Condenser.  
Kumta ka rukom ban pynbha ia kane ka, jingpah ka long  
kumne. Weng noh shuwa ia ki sainar kiba pyndait ha u  
Gang Condenser. Nangta shim ia u Bulb holder aba la pyn-  
dait Bulb uba 100 Watts. Pyndait ia uwei u sainar  
na kine ar ki sainar kiba wan na u Bulb holder sha kawei ka  
liang jong u Gang Condenser bad ia uwei pat u sainar sha  
ka Plug. Nangta shim da uwei u sainar, pyndait ha ka  
chasis jong ka Radio bad ia kawei ka tdub jong u pat sha  
ka Plug. Sdang khyrwait ia u Gang Condenser shane sha-  
tai na u jingwad station. Lada ka don ka jingia tyngkhuh  
ha u Gang Condenser u Bulb un meh bad u Gang Conden-  
ser un mih ki phliah ding. Khyrwait kumne bunsien tad  
haduh ba u Bulb un ym meh shuh bad u Gang Condenser  
ruh un ym mih phliah ding shuh. Leh kumjuh sa ia kawei  
ka liang jong u Gang Condenser. Ynda la dep leh kumne;

sei noh ia kito ki sainer na u Plug bad loit noh ia kito ki sainer kiba pyndait baroh. Sa pyndait biang ia kito ki sainer kiba la loit na u Gang Condenser kiba dei na ka Circuit. Nangta pynmeh ia ka Radio bad engap la ka dang don jingriew khred khred ne em Lada em kata ka mut ba u Gang Condenser u la bha.

La kine baroh kiba la pyni haneng ki bha lut. Phai mynta sa sha ki IF Transformer Thew ia ka Continuity jong kine ki IF Transformer bad da ia nuor bad ka Circuit Diagram. Lada u Meter um pyni Continuity kata ka mut ba u IF Transformer u la sniew. Loit noh ia u na ka Circuit bad pyndait da uwei uba thymmai uba dei ka juh ka bor bad uto uba la sniew. Ynda la dep leh kumne sa align ia ka Radio. Ia ka rukom align leh kumba la bthah ha ka jingkdew lamphrang.

## KA AC/DC SET

Ha kane ka jait set, ki jingsniew kiba lah ban pynlong kumne ki long kumjuh kum ba ka Transformer Set. Bad ia ka rukom pynbha leh kumjuh kumba la kdew ha ka.

## KA TRANSISTOR SET

Ha kane ka jait set, ki daw kiba pynlong ia kaba kan sniew kumne ki long kiba bun. Kumta la thoh hangne tang katto katne ki jait jingsniew kiba juh kham jia khah khah.

Ha kaba sdang peit shuwa ia ki sainer ioh don kiba lait na ka circuit. Lada don kiba lait pynbha ia ki da kaba pyndait pain biang ha ka Circuit. Nangta peit ruh ia ki Condenser bad ia ki Resistor ba ioh ki lait na ka Circuit. Teng teng la juh shem ba ki trai Radio haba ki thep Battery thymmai ne pynkhuid ia ka Radio, ki kum pynkhih ia kine. Kumta da kaba pynkhih kine ki tier ki lait noh na ka Circuit bad ki pynlong ba ka radio kan sniew. Peit bha ia kane bad lada don ba lait pyndait pain biang ia ki.

La juh shem ruh ba ki trai haba ki thep Battery thym-mai ha ka Radio, khamtam ha kito ki radio kiba rit. ki juh kham pyntyngkhuh ia ki Transistor. Kumta haba jia kumne, ki kjat jong ki Transistor ki lait noh na ka circuit bad ki pynlong ia ka Radio ba kan sniew. Kaba dei ban leh ka long ban da peit bha ia kane ka bynta lada don kiba lait pynkhuid bha ia kito ki kjat bad sa kynthah pain biang ia ki. Haba kynthah pain kumne ia u Transistor, kymaw ban da bat da ka plier kaba nep khmut na ka kjat jong uto u Transistor, khnang ba ka jingkhuit kan ym ioh rung sha u Transistor. Bad lada ka jingkhuid ka ioh rung u Transistor un sniew lane tlot bor noh.

Nangta sa pynmeh ia ka radio bad sngap la ka la wan jingrwai ne em. Lada em, peit shuwa ia u Diode uba dei hapteng jong u Volume Control bad u IF Tranformer uba lai. Pynlip shuwa ia ka Radio. Weng noh ia uwei u kjat jong u na ka Circuit. Thew da u Meter la u don Continuity ne em. Lada don continuity, pynkylla ia ki sainar jong u Meter da khangpong bad peit biang la u don continuity ne em. Lada u pyni continuity bad ia ka Ohms kaba heh kata ka mut ba u dang bha. Hynrei lada u pyni tang ia ka continuity kata ka mut u la sniew. Loit noh ia u bad pyn-dait noh da uba thymmai.

Lada une u Diode u bha. peit sa ia ki IF Transformer da ka Signal Injection na uwei u pin jong u IF sha uwei pat. Lada ka signal ka jah kata la lah ban suba ba la don ka jingsniew ha kata ka jaka. Kumta shuwa ban loit ia uto u IF Transformer uba la sniew da ia nujor shuwa bad ka circuit Diagram. Lada ha ka Circuit ka pyni ba uto u pin u don ka jingiadei bad uwei pat uba don ka jingpah haba wad da ka signal, kata ka mut ba uta u IF Transformer u la sniew weng noh ia u na ka circuit bad pyndait noh da uba bha. Leh kumjuh ia kiwei kiwei ki IF Transformer kiba don ha kata ka Radio. Da kane ka juh ka rukom lah ban leh ha ba wad ia ka Signal ha ki Osilator Coil.

Haba kine baroh kiba la kdew haneng ki bha, phai mynta sa sha u Frequency Transistor: Thew ia ka voltage jong une u Transistor. Ka Negative Voltage jong u Collector ka dei ban long kaba heh. Ka voltage jong u Base ka dei ban long kaba rit bad ia ka voltage jong u Emitter ka dei ban long kaba kham rit eh. Lada kine ki voltage ki ba la kdew haneng ki bakla, kumta la dei ban suba ba une u Transistor u la sniew. Loit noh ia une u Transistor na ka Circuit, bad pyndait da uba dang bha uba dei u juh u number bad uba r.m.

## KA LYNNONG KA BA SAW

### KA RADIO KABA BUN JINGPYNWIT

Kum ha kane ka jingsniew ym lah ban tip ia ka daw ba thikna nangno ka wan ka jingpynwit. Don bup ki daw kiha lah ban pynlong ia ka set ba kan long kumne. (1) Kham bunsien la juh shem ba ki sainer lyngkhuid ki ia tyngkhuh para sainer. (2) Ka jingbym dait pain bha ki sainer. (3) Ka jingia tyngkhuh jong u Voice Coil bad u Magnet ha ka Speaker. (4) Ka jingrung ki nar rit ha ka Speaker. (5) Ka jinglait u sainer primary na u Output Transformer. (6) Ka jingia shong synjor jong ki coil kiha kyllain ha u Transformer. (7) Ka jingbym skhem jong ka Frame ha u Transformer. (8) Ka jingshort u Condenser. (9) Ka jingjaboh ne jakhlia jong u Volume Control bad kiwei kiwei. (10) Ka jingia shong synjor jong ki valve ha ki Sucket jong ki.

### KA TRANSFORMER SET

Ha kane ka jait set, peit shuwa ia ki sainer ha u plug ki iadait bha ne em bad kita ki pin jong u plug. Lada kine ki bha, sei ia ka Chasis jong ka Radio shabar. Nangta pynmeh ia ka Radio bad peit bha ba'ioh don ki sainer kiha ia tyngkhuh bad kiwei pat. Pynkynriah ia kine ki jingia tyngkhuh da u dieng uba nep uba rit knang ba kin ym ia tyngkhuh shuh. Ha ka por ba ka Radio ka meh wat juh pyndonkam da u screw driver haba pynkynriah ia kine ki sainer. Lada leh kumne, ki tiar jong ka Radio ki lah ban sniew, lada kum pyn short ia u sainer uba don ding bad ka chasis. Ha kajuha ka por peit ruh ba ki sainer ki dei ban iadait bha haba pyndait pain ia ki. Lada kim dait bha ki lah ban long ka daw jong kane ka jingsniew.

Ynda kinehaneng ki bha lut, phai mynta sa sha ki Valve. Pynkhih ia ki Valve da ka kti khnang ba kin ia tyngkhuh (contact) bha bad ki sucket. Ka juh jia ba haba ki pin jong ki valve bad jong ki sucket kim iatyngkhuh bha ki juh pynmih ia kane ka jingsniew. Bad lada



dei ban sei lane sieh ia ki valve, kynmaw ban da pynlip shuwa ia ka Radio, khnang ba haba kum bakla sieh ia ki ki valve ki, ym sniew. La juh shem bun sien haba ki valve ki orpait, ka lyer ka ioh rung shapoh ki valve Haba pynmeh ia ka Radio ki valve ki khluid bad ki pynlong ia kane ka jait jingsniew. Weng noh ia kine ki valve bad pyndait noh da kiba bha.

Lada pynmeh ia ka Radio, ha kaba sdang ka pyni kum kaba dang bha bad tang katto katne por ka pynmih ia kane ka jingsniew. Kumta kaba dei ban suba ka long ba ki valve kiba dei ha ka Audio circuit ki la sniew. Weng noh ia kine bad pyndait da kiba bha. Haba u Coupling Condenser uba dei hapteng u Grid jong u Output valve bad u Plate jong ka Audio amplifier valve u juh pynmih ia kane ka jait jingsniew. Weng noh ia une bad pyndait da uba bha. Kumta haba kine ki Coupling Condenser bad ki Bypass Condenser ki la sniew, ha kiwei kiwei ruh ki bynta ki juh pynmih ia kane ka jait jingsniew. Weng noh ia ki bad pyndait da kiba bha. Thew ruh ia ki Resistor kiba pyndait bad ki khamtam ia kito ki Resistor kiba pyndait bad u Plate, u Screen bad u Cathode jong ki valve. Lada kine ki la sniew, loit noh ia ki bad pyndait da kiwei kiba bha kiba don ka juh ka bor bad kito kiba la sniew.

La juh shem ruh ba u Volume Control bad u Tone Control haba ki jaboh ki juh pynmih ia kane ka jait jingsniew khamtam haba khyrwait ia ki, ki pynmih ia ka jingpah khred khred. Pynjah ia kane ka jingriew da kaba pynjaw da ka umphniang kaba pynkhuid ia ki Volume Control na kito ki jaka pyndait sainar. Nangta sa khyrwait sharum shaneng ia u Volume control haduh ba ka umphniang kan da ioh rung lut ha u volume control ne u Tone control Kumta da kaba leh kumne ka jingpah kan jah. Hynrei lada kam jah kaba dei ban leh ka long ban weng noh ia uta u volume control bad pyndait noh da uwei uba ka juh ka bor bad uta uba la sniew.

Haba ki coil jong ka speaker ki ia tyngkhuh bad ka magnet ki juh wanrah ia kane ka jait jingsniew. Kumta

loit noh ia kane ka speaker bad pynbha ia ka da ka rukom pynbha ba la bthah ha ka lynnong kaba shadien. Ynda la dep pynbha sa pyndait biang ia ka. Da kaba leh kumne ka jingsniew kan jah.

### KA AC/DC SET

Ha kane ka jait set la ju shem ba kum kane ka jait jingsniew ka long na ka Speaker. Ka jingsniew ki Coupling Condenser bad ki valve.

Kiwei ki jingsniew ki long hi kumjuh kum ha ka Transformer Set.

### KA TRANSISTOR SET

Ha kane ka jait set la juh shem ba ki Battery ki long ki daw kiba wanrah ia kane ka jingsniew. Lada ki battery ki la duna voltage than lane heh than eh ruh ka wanrah ia kane ka jait jingsniew. Kumta dei ban da peit bha ia kane ka bynta khamtam ia kito ki set kiba rit.

Ka jingbym iadait bha jong ki sainar haba kynthah pair ruh ka wanrah ia kane ka jait jingsniew. Namarkata haba kynthah pain da pynkhuid bha ia kito ki khmut sainar da ka tari nep bad sa da tah da ka Flex Resin bad sa kynthah pain ia ki. Ynda la dep kynthah pain da pynkhih biang ia kito ki sainar khnang ban tip la ki la bat pain bha ne em

Haba ki coil jong ki IF Transformer ki lait na ka Circuit bad kumno re kumno ki leit ia tyngkhuh bad ka jingtap jong ki, ki ju pynmih ia kine ki jingsniew. Kumta thew ia ka continuity jong kine ki IF Transformer bad lada don jingsniew loit noh ia ki bad pyndait noh da uba thymmai.

Lada kane ka jingpynwit ka jur than haba wan ki jingrwai kiba khlain kumta ka jingsniew ka long ha ki RF bad IF Stage. Peit bha ia ki Condenser, thew ia ki voltage jong ki lada ki la sniew (leak), weng noh ia ki bad

pyndait noh da kiba thymmai kiba dei ka juh ka bor bad kito kiba la sniew. Ia ka rukom thew leh kumjuh kumba la bthah ha ki lynnong kiba shakhmat.

Haba don ka jingsuba ba don ka jingsniew ha ka Audio Circuit kaba dei ban peit ka long ia u Bypass Condenser. Nangta haba shem ba une um shym sniew peit sa ia u Resistor bad ia u Condenser uba dei ha kata ka circuit. Lada kine ki sniew weng noh ia ki pyndait da uba thymmai.

Haba sniew u Osilator Coil ruh ka wanrah ia kane ka jingsniew, thew ia ka continuity jong ki sainar jong une u coil. Lada shem ba uba sniew da kaba dkut ki sainar ne ia tyngkhuh (short) para sainar pynbha ia ki bad lada ym lah pyndait noh da uwei uba thymmai.

Lada u Diode uba don hapteng u IF Transformer uba nyngkong bad u IF Transformer uba ar u la sniew, u juh wanrah ia kane ka jingsniew. Loit noh ia uwei u kjat jong u shuwa bad sa thew ia ka continuity jong u.

Hynrei lada shem ba u la sniew pyndait noh da uba thymmai. Ka rukom thew ia une u Diode ka long hi kumjuh kumba la kdew sha khmat.

Ka jingsniew jong ki Volume Control ruh ka wanrah ia kane ka jingsniew. Namar kata pynbha ia ki kumba la bthah ha ka AC Set. Lada um lah pynbha weng noh ia ki bad pyndait da kiba thymmai

Ynda haba baroh kitei kiba la kdew haneng shem ba ki bha lut baroh Kumta kaba sah ka long ban peit bha ia kito ki tiar ba ioh don ka jing orpait ki bym dait pain bha bad ka circuit. Peit bha ruh ba ioh don ka jingorpait ha ka printed circuit, da kaba peit da ka iit shna Baje. Lada don ka jingorpait pyndait pain halor jong ka da uwei u sainar ha ka rukom ba krap ne snap halor kata ka jaka kaba la orpait Peit bha ruh ba kan ym don ka jingshort circuit.

Kaba khadduh ka long ban peit ia ka Speaker Lada shem ba kane ka Speaker ka la sniew. pyndait shipor da kawei kaba bha bad lada shem ba da kaba pyndait da kane ka speaker kaba bha, ka riew bha bad kata ka jingsniew ka jah. Kumta lashem ba ka Speaker kaba rim ka la sniew. Pynbha ia kane ka speaker, bad ia ka rukom pynbha leh kumba la bthah ha ka lynnong kaba sha dien Nangta ynda la dep pynbha ia kane ka Speaker weng noh ia kato ka Speaker bad pyndait da kata ka Speaker kaba del jong kane ka Radio.

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## KA LYNNONG KA BA SAN

### KA RADIO KABA JUR THAN KA JINGPAH

Ha kane ka lynnong ngin ia kren shaphang ka Radio kaba jur than eh ka jingpah. Wat lada don hateng hateng ba lah ban iohsengew ia ka jingrwai ka jingpah ka jur than, kat haduh ba ym lah ban sngewthuh shuh ia ka jingrwai ne jingkren. Kumta ha kane ka jait jingsniew lah ban suba (1) Ba la sniew ki Filter Condenser khamtam u Electrolitic Condenser (2) Ba ki valve ki la sniew (3) Ba la sniew u Output Transformer. Kane ka jait jingsniew la juh shem ba ka jia khah khah ha ka Transformer set ban ha kiwei kiwei ki jait radio.

### KA TRANSFORMER SET

Ha kane ka jait radio, kaba nyngkong kaba dei ban suba ka long ia u Electrolitic Condenser. Ha une u Condenser don ar bynta kiba la ju tip kum ki input condenser bad output condenser. Lada uwei na kine u sniew, sngap thuh u dei u ei u bynta. Haba u Input Condenser u la sniew, ka jur bha ka jingpah. Ym lah ban sngewthuh ia ka jingrwai ne jingkren namar ba ka jingpah ka jur katta katta kat haduh ba ia ka jingrwai la tyllap da kane ka jingpah. Bad haba sniew u Output Condenser ka jingpah ka kham duna bad ia ka jingrwai lah ban iohsengew, hynrei ynda la plie heh ia ka volume kine ki jingpah ki ia wan ryngkat bad ka jingrwai.

Sei ia ka chasis shabar bad pynmeh ia ka radio. Nangta thew ia ka voltage jong kine ki condenser, input bad output condenser. Lada u input condenser u la sniew, un pyni duna ha ka voltage DC bad ha baroh ki bynta jong ka radio. Hynrei u output condenser lada u la sniew ka DC voltage kan ym duna tang ba kan wanrah ia ka jingpah ynda pynheh ia u volume ha ka por ba plie jingrwai. Pynlip ia ka radio bad loit ia kito ki sainar kiba pyndaif pain ha kito ki pin jong u condenser. Nangta sa thew ia ka continuity jong kine ki condenser. Shwa ban

thew kumne da pyniap ia ka voltage jong kine ki condenser da kaba pynshort ia kito ki pin jong ki sha ka ohasis. Ia ka rukom thew leh kumjuh kumba la batai ha ki lynnong kiba sha khmat. Lada ki la sniew loit noh ia ki bad pyndait da kiba thymmai kiba don ka juh ka bor bad kito kiba la sniew. Haba kine ki condenser ki bha, peit ia ki Filter Condenser baroh kiba don ha ka circuit. Lada kine ki la sniew ki pynmih ia ka juh ka jingsniew, tangba ka jingpah ka duna ban ia kito kiba la kdew haneng. Thew ia ka continuity jong kine ki condenser da kaba loit shwa ia uwei u kjat jong u. Lada shem ba u la sniew loit noh ia u bad pyndait noh da uwei. Leh hi kumjuh ia kiwei kiwei ki Filter Condenser.

Lada kitei kiba la kdew haneng ki bha lut, phai mynta sa sha ki valve. Kaba dei ban peit ka long ia u output valve bad ia u valve jong ka Audio Amplifier. Lada ki Filament ki la short ne ia tyagkhuh bad ki cathode, ki pynmih ia kane ka jait jingsniew. Sei noh ia kine ki valve bad sieh da kiwei kiba thymmai. Nangta pynmeh ia ka Radio bad sngap la ka radio ka la bha ne em.

Pyrshang ban bat da ka kti ia uwei pa uwei u valve uba don ha ka radio. Lada uwei na kine u pynmih ia ka jingpah ha ka speaker ha ka por ba kthah kumne, kata ka mut ba u lain grid u la lait na ka connection. Thew ia ka voltage jong u Resistor uba dei na u grid jong uta u valve sha ka ground. Lada une u la sniew pyndait noh da uwei uba bha uba dei ka juh ka bor bad uba rim.

Thew ruh ia ka continuity jong ki coil kiba dei ha ki IF Transformer bad ia ki jong RF stage, lada ki sainar ki la sniew ne lait ki pynmih ia kane ka jait jingsniew. Pynbha ia ki bad lada shem ba ym lah pynbha shuh, sei noh ia kito kiba la sniew bad pyndait noh da kiwei kiba thymmai. Peit ruh ba ioh don ki sainar kiba lait khamtam ia u sainar Arial uba dei ha ka RF lane Mixer. Lada don kiba lait pynbha ia ki.

Haba lait ki connection ha u volume control ruh ki pynmih ia kane ka jait jingsniew. Peit bha ia uto u sainar uba wan na u Grid return na ka liang jong ka Audio kaba nyngkong. Lada u la lait pynbha ia u da kaba kynthah pain biang khnang ba un iadait pain bad u Volume Control.

Lada kane ka jingpah kam man jah satia wat la pyrshang ban pynbha kat kum ba la pyni haneng. I'ynmeh ia ka radio, nangta shim uwei u condenser uba 1.mfd, pyndei ia kawoi ka khmat sainar ha u grid uba dei jong ka output bad uwei sha ka ground ne chasis. Sngap ia ka jingpah, ka jah ne em Lada ka la jah pyrshang ha kane ka rukom sa na u grid jong ka Audio stage sha ka ground. Lada ka jingpah kam jah haba leh kumne, kata ka mut ba la lap ia ka jingsniew. Weng noh ia uta u condenser uba don ha kata ka bynta bad pyndait noh da uba thymmai uba don kajuha ka bor bad uta uba la sniew.

Haba la pyrshang katne ruh ka jingpah kam man jah satia, peit mynta sa sha ki Bypass condenser kiba pyndait ha u screen bad Cathode jong u ka RF bad IF stage. Lada kine kiba la sniew ki pynmih ia kane kajuha ka jait jingsniew. Thew da u meter bad lada lap ba ki la sniew, weng noh ia ki bad pyndait noh da kiwei kiba iaryngkat kajuha ka bor bad kito kiba la sniew.

## KA AC/DC SET

Kum kane ka jait jingsniew ha kane ka jait set, ka juh jia khah khah na kaba la sniew ki Filter condenser bad u Electrolytic condenser. Lada ka dei ka set kaba la rim bha. la dei ban pyndait thymmai da kiwei pat ki Filter condenser. Namar ynda ki filter condenser ki la rim ki ju sniew noh.

Lada kine ki Filter Condenser ki bha, phai mynta sa sha ki valve Da ka jingsniew jong ki valve ruh ki lah ban pynmih ia kane ka jait jingsniew, khamtam u Output valve. Thew ia ka voltage jong u, ia ki condenser bad ia ki Resis-

tor kiba iadel bad u. Lada ki la sniew pyndait noh da ki-ba thymmai : Sei noh ia uto u valve uba suba ba u la sniew ne weak, sieh noh da uba thymmai. Nangta sa pynmeh ia ka Radio bad sngap la ka jingpah ka la jah ne em,

Teng teng la ju shem ba u Gang Condenser u juh short da kaba ring pyrkhing ia u Dial Cord lane ba la sniew ki washes jri kika pyndait hapoh jong u. Lada uue n Gang Condenser u ia tyngkhuh bad ka chasis u juh pynmih ia kane ka jingsniew, Teh pynsynjor ia u Dial Cord bad peit ba u Gang Condenser un ym ia tyngkhuh bad ka Chasis. Nangta lada ki washer jri ki la sniew, weng noh ia ki bad pyndait noh da kiwei ki washer jri kiba thymmai, da kaba leh kumne ka radio kan bha pat.

Kiwei kiwei ki jingsniew ki long hi kumjuh kum ha ka Transformer set, bad leh hi kumjuh ha kaba pynbha ia ki.

## KA TRANSISTOR SET

Haba ka Transistor ka jur than ka jingpah, kaba dei ban peit ka long ia ki Battery. Lada ki Battery ki la tlot ki juh pynmih ia kane ka jingsniew. Pynmeh ia ka set, nangta sa thew ia ka voltage jong ki Battery. Bad lada shem ba ki duna than ka voltage, weng noh ia ki bad pyndait da ki Battery kibn dang thymmai.

Lajuh shem bunsien ba haba ka set ka jur than ka jingpah ka long ba ki tiar ne ki sainar kim ia dait (contact) bha bad ka circuit. Kumta dei ban da peit bha ia kane ka bynta. Haba wad ia kine ki jait jingsniew, pyndonkam da ka nap rit. Pynkhih da ka nap ia iwei pa iwei iba don ha ka circuit bad ia kito ki sainar kiba pyndait ha ka. Lada don hangno ne hangno ka jingshong synjor, pyndait pain bha ia ka. Nangta pynmeh ia ka radio bad sngap ia kata ka jingpah ka la jah ne em. Lada kam jah kata ka mut ba la don jingsniew shawei pat

Phai mynta sa sha ka bynta jong ka Audio. Thew da u meter, ia kito ki compling condenser bad ia kito ki bypass



condenser kiba dei ha kane ka circuit. Lada ki la sniew, loit noh ia ki na ka circuit bad pyndait noh da kiwei kiba thymmai kiba iaryngkat kajuh ka bor bad kito ki condenser kiba la sniew.

Lada ki IF Transformer ki la sniew ruh, ki juh wanrah ia kane ka jait jingsniew. Ia ka rukom wad ia ki jingsniew kiba don ha ki IF Transformer, leh hi kumjuh kumba la bthah ha ki lynnong kiba sha khmat. Lada shem ba ki la sniew weng noh ia ki bad pyndait noh da kiba bha, Bad ynda la dep leh kumne sa align pat ia kine ki IF Transformer da ka jingiarap jong ka Signal Generator. Ia ka rukom align leh hi kumjuh kumba la bthat ha ka jingkdew lamphrang.

La juh shem ruh ba ladaki Osilator coil ki sniew kijuh wanrah ia kane ka jait jingsniew. Thew da u meter ia kine ki coil lada ki lait ki sainar. kynthah pain biang ia ki Bad lada ki la short, weng noh ia ki bad pyndait noh da kiwei kiba bha kiba dei ka juh ka bor bad kito kiba la sniew.

Peit bha ia kito ki jingtap jong ki IF Transformer. Lada kine kim iadait bha bad ka ground. ki wanrah ia kane ka jingsniew. Pynkhuid bha ia kito ki bynta bad sa kynthah pain bha ia kine khnang ba kin ia contact bha bad ka ground.

Haba baroh kitei kiba la kdew haneng ki bha lut, phai mynta sa sha ki Transistor. Thew ia ka voltage jong kine ki Transistor da u meter khamtam ia kito ki Transistor kiba dei ha ka bynta jong ka Audio. Lada ki la sniew pyndait noh dakiwei. Ia ka rukom thew leh hi kumjuh kumba la bthah ha ki lynnong kiba sha khmat.

Haba wad ia kano kano ka jingsniew ha ka Transistor, kaba dei ban wad ka long da ka Signal Tracer. Da kane ka tier lah ban shem klo i ia ki jingsniew kiba don ha ka set.

## KA LYNNONG KA BA HYNRIEW

(Ka Radio Ka Bym Mih Station Ei Ei)

Ha kane ka lynnong ngin ia kren shaphang ka radio ka bymmih station eiei. Ki daw kiba kongsan kiba lah ban pynlong ia ka radio ba kan sniew kumne ka long :— (1) Ba don ka jingsniew ha ka Frequendy Circuit (2) Ba la short u Gang condenser (3) Uwei na ki IF Transformer u la sniew (4) Ba u Resistor uba pyndait hapteng u Electrolictic condenser u la sniew (5) Ka jingbym lah ai ding bha u Rectifier valve (6) Ka jingsniew u Trimmer (7) Bad ka jingia tyngkhuh u arial ha ka chasis.

### KA TRANSFORMER SET

Pynmeh ia ka radio, nangta pyndei da u screw driver na kato ka thliw kaba ju pyndait record player. Sngap la ka don jingpah (Audio) ne em ha ka speaker. Lada ka jingpah ka jam kata ka mut ba ka Amplifier Section (bynta) ka dang bha bad lada kam don ne rit than ka jingpah, pynbha ia kane ka bynta da kaba leh kumba la bthah ha ki lynnong kiba sha khmat. Ynda la lah pynbha pynmeh ia ka radio bad sngap ia ka jingrwai ka la wan ne em haba khyrwait ia u Jingwad station (Tuning knob). Lada kam wan phai sa sha u valve uba trei ia ka kam Frequency Changer.

Pynlip ia ka radio, nangta sa sei ia une u valve bad thew ia ka continuity jong u Filament jong u, lada u la sniew pyndait noh da uba thymmai. Hynrei lada u Filament u bha bad ka radio kam wan jingrwai, kaba dei ban peit ka long ia kito ki resistor bad ia ki condenser kiba don ha kane ka bynta. Ia ka rukom thew leh hi kumjuh kumba la batai ha ki lynnong kiba sha khmat.

Lada kitei kiba la kdew haneng ki bha, phai mynta sa sha u Gang Condenser. Khyrwait ia u Tunning knob, sngap la u don jingshort ne em. lada um don kata ka mut ba u

Gang condenser u dang bha, Ha kajuh ka por peit ia u Gang condenser u khiih ne em, haba khyrwait ia u Tunning knob. Lada um khiih kata ka mut ba ka drum kaba pyndait ha u ka la synjor. Pynskhem ia kane da kaba sei shwa ia ka chasis shabar bad sa pynskhem ia ka drum da kaba khyrwait skhem ia u screw jong ka drum khnang ba un skhem bha ha u gang condenser. Lada u gang condenser u la short u juh pynmih ia kane ka jait jingsniew Pynbha ia u kumba la bthah ha ki lynnong kiba sha khmat.

Haba une u gang condenser u bha, peit mynta sa sha ki IF Transformer Lada ki IF Transformer ki sniew lane ki kynriah jaka da kaba um ka bthing ha ki, ha ka por ba ka radio ka khluid ki pynlong ia kane ka jingsniew. Pynbha ia kane da kaba align biang ia ki IF Transformer. Ia ka rukom align leh hi kumjuh kumba la bthah ha ka jingkdew lamphrang. Pynmeh ia ka radio bad sngap la ka jingrwai la ka wan ne em.

Lada em. phai mynta sa sha ki Trimmer. Teng teng la ju shem ba haba kine ki Trimmer ki sniew ne short ki wanrah ia kane ka jingsniew. Pynbha ia kine da kaba sieh Mica thymmai hagdeng jong ki Bad peit ruh ia kito ki sainar kiba leit sha u Grid bad sha ka plate jong ki valve ba ioh ki lait na u Resistor.

Haba ki sainar ki lait na ka jaka ba kynthah pain, ne ki coil ki dkut ha ka RF bad Mixer stage, ka ju wanrah ia kane ka jait jingsniew Pynbha ia kine kiba la sniew. Lada ym lah, loit noh ia ki bad pyndait noh da kiba thymmai.

Peit ia u Rectifier Valve, thew ia ka voltage jong u kaba ai sha ka circuit lada ka supply ka duna haba ianujor bad ka valve Data. Sei noh ia une u valve bad pyndait noh da uba thymmai.

Haba uto u Resistor uba pyndait hagdeng jong u Electrolytic condenser u la sniew u ju wanrah ia kane ka jingsniew. Thew ia ka voltage jong u Electrolytic conden-

ser. Lada u input condenser u pyni voltage bad u output condenser pat um pyni voltage ka mut ba une u Resistor u la sniew. Weng noh ia u na ka circuit bad pyndait da uba thymmai uba don kajuh ka bor bad uta uba la sniew.

Haba u Ferrite Rod u la khein bad u Arial u short da kaba iatyngkhuh bad ka chasis u pynmih ia kane ka jing-sniew. Pyndait da uwei u Ferried Rod uba thymmai bad pynbha ia kita ki coil kiba kyllain halor jong u. Bad pynkynriah ruh ia kata ka jingshort u Arial bad ka chasis. Ynda la dep leh kumne ka radio kan bha pat.

### KA AC/ DC SET

Kaneka jait set kam don power transformer. Ha ka jaka jong une u Transformer la ju pyndonkam da u main Resistor. Kumta haba kane ka set ka meh, ka jingkhluid ka long kaba kham jur ban ia ka Transformer set. Da kane ka jingkhluid la pynum ia ka bthng kaba pyndait ia ki coil ha ki IF Transformer. Haba ka bthng ka um ki coil ruh ki ia syntuid lang sharum. Kumta da kane ka jing kynriah jaka jong kine ki coil ruh ka wanrah ia kane ka jing-sniew ha ka radio. Kaba dei ban leh ka long ban align ia ki IF Transformer. Ia ka rukom align leh kumba la bthah ha ka jingkdew lamphrang. Lada ki IF Transformer ki la ia short da kaba kynriah jaka kumne, kaba dei ban leh ka long ba dei ban loit noh ia kine shi syndon bad ban pyndait noh da kiwei. Kane ka jingjia ka ju jia khah khah ha kane ka jait set.

Ia kiwei kiwei ki jait jingsniew ki long hi kumjuh kum ha ka Transformer set. Bad leh hi kumjuh ha kaba wad ia ka jingsniew bad ha kaba pynbha ia ki.

### KA TRANSISTOR SET

Ka jingsniew ha kum kane ka jait set ka ju jia ba (1) Ka jingsniew u Frequency Transistor (2) U Diode (3) u gang condenser (4) Band Switch (5) Jingpait ne jingorpait ka Printed circuit bad (6) ka jingsniew ki IF Transformer.

Pynmeh ia ka Radio, nangta sa thew ia ka voltage jong u Frequency Transistor. Lada ka don ka jingiapher ha ka voltage kaba ki kjat jong u ki pyni, kata ka mut ba une u Transistor u la sniew, Ia ka rukom thew bad ia ka rukom ianujor ia ka negative voltage leh kumba la bthah ha ki lynnong kiba sha khmat. Lada u la sniew weng noh ia u bad pyndait noh da uwei uba bha uba dei kajuh ka number bad uta u ba la sniew.

Lada une u Transistor u bha, phai mynta sa sha u Diode uba don ka jingiadei bad u Volume Control. Loit noh shwa ia uwei u kjat bad thew ia ka continuity jong u. Ia ki rukom thew leh hi kumba la bthah. Lada u la sniew weng noh ia u na ka Circuit bad pyndait noh da uba thymmai. Ynda ladep leh kumne pynmeh ia ka radio bad ngap ia ka jingrwai la ka la wan ne em.

Haba u gang condenser u la short u wan rah ia kane ka jingsniew. Pynbha ia kane ka jingsniew bad lada ym lah weng noh ia u na ka circuit bad pyndait noh da uwei nba thymmai uba dei kajuh ka bor bad uba rim.

La ju shem ba ki sainar kiba pyndait ha u Band switch ki lait, pynbha ia kine kiba lait da kaba kynthah pain biang ha u Band swith. Nangta pynmeh ia ka set bad ngap la ka jingrwai ka la wau ne em. Lada em, pynkhih ia u Band Switch da kaba pynkylla sha kawei pat ka Band. Bad lada ha kane ka Band pat ka wan jingrwai, peit bha ia ki Osilator Coil ioh ki lait ki sainar kiba pyndait ha ki ne ki la sniew ki coil, bad lada kine ki bha, kata ka dei ba u Band Switch u la sniew. Loit noh ia une u Band Switch bad pyndait da uwei uba thymmai, uba dei kajuh ka jaid bad uto uba rim.

Haba ki coil jong ki IF Transformer ki la sniew, ki juh wan rah ia kane ka jingsniew. Thew ia ka continuity jong ki bad lada kim pyni continuity kata ka mut ba ki la sniew. Loit noh ia ki bad pyndait da uba thymmai, Ia ka rukom wad ia ka jingsniew leh kumjuh kumba la bthah. Nangta ynda la pyndait da kiwei ki IF Transformer, sa

align biang ia kine ki IF Transformer. La juh shem bunsien ba shwa ba ki trai radio ki wan rah ia ka radio sha ki nongshna, ki da lulia shwa ma ki da kaba khyrwait ia ki Trimmer bad ki IF Transformer. Lada kine ki la bakla ka radio ka sniew, kumta dei ban da peit bha ia kane ka bynta.

Lada ka printed circuit ka orpait, ka juh wan rah ia kane ka jingsniew. Wad ia kane ka jingsniew da u meter lane da u Signal Injector. Ia ka rukom wad bad ia ka rukom pynbha leh kumjuh kumba la bthah ha ki lynnong kiba sha khmat.

## KA LYNNONG KA BA HYNNIEW

(KA RADIO KABA TLOT KA JINGSAWA)

Ha kane ka lynnong ngin iakren shaphang ka radio kaba tlot bad duna ha ka jingsawa, Ki sur ki lah ban wan na kane kano ka band hynrei ka jingsawa ka long kaba duna. Kumta ka long kaba kham shitom ban iohsengew shai ia ki sur khamtam haba sngap kham na pajih. Ki daw kiba pynlong kumne ki long kumne harum—(1) Ka jingsniew ki IF Transformer, (2) Ka jingsniew u Rectifier Valve, (3) Ka jingsniew u IF Valve, (4) Ka jingsniew u Audio amplifier bad u Frequency valve u la tlot.

### KA TRANSFORMER SET

Bunsien la ju shem ba ki trai radio shwa ba kin wanrah ia ki radio jong ki sha ki nongshna, ki da lulia da kaba khyrwait ia ki Trimmer jong ki IF Transformer bad kiwei kiwei ki bynta jong ki. Ynda kim lah shuh ban pynbha ki sa wanrah sha ki nongshna. Kumta haba ioh kum kane ka jait set bad kane ka jait jingsniew, kaba nyngkong kaba dei ban peit ka long ia ki IF Transformer. Peit bha la ki trai Radio ki la khyrwait ne em ia ki IF Transformer. Lada ki la khyrwait kata ka mut ba ka Alignment jong ka Radio ka la bakla. Pynbeit ia kane ka jingbakla da kaba align biang ia ka radio da ka jingiarap jong ka Signal generator. Ia ka rukom align leh kumba la bthah ba ka jingkdew lamphrang.

La juh shem bunsien ba haba ki trai radio ki khyrwait ne sei kai ia ki Trimmer jong ki IF Transformer. Bunsien ki core kijuh sah kut noh shapoh ki IF Transformer bad ki mih tang ki screw. Kumta haba align ia ka radio ki khih tang ki screw bad ki core ki sah hi kumjuh. Namar kata ka Alignment kam long haba align ia ki. Kaba dei ban leh ka long ban loit noh shwa ia uta u IF Transformer shabar na ka circuit bad pyndait noh da uwei u IF Transformer uba thymmai uba dei ka juh ka bor bad uto uba la sniew. Hynrei lada ym ioh spare part, pynbha ia une u

juh u IF Transformer uba la sniew. Shim ia uto u IF Transformer bad loit ia ka jingsop jong u. Nangta sei ia kine ki core da kaba tyrsuh da ki sainar kiba rit kiba jem, kum u pin pyndait jain bad kiwei kiwei. Haba leh ia kane da sumar bha ia ki coil jong u IF Transformer kiba kyllain halor jong kine ki thliew kin nym sniew. Ynda haba kine ki core ki la mih, pynbha pat ia ki. Da pynkhuid shwa ia ki bad ia kito ki screw, nangta sa sop ia kine baroh ar, ia u screw bad ia u core da ka sololiod kaba stang kaba la kyllan da ka quickfix napoh bad sa kyllain da u ksai nalar jong ka sololiod khnang ba kin dait bha. Haba leh kumne da peit bha ba u core um dei ban ia tyngkhuh bad une u screw. Buh katto katne por ha ka sngi khnang ba un rkhiang. Ynda u la rkhiang loit noh ia uto u ksai bad sa thep ia une u core ha ka thliew jong u IF Transformer. Nangta sa sop biang ia u IF bad sa pyndait ha ka radio. Ynda la dep pyndait sa align ia ka radio da ka signal generator.

Haba align, kumne shem ba kam long bha. Peit ia ki sainar kiba leit sha u Plate bad u Grid jong ki valve ioh ki lait, bad peit ruh ia u Resistor ha ki. Lada ki la sniew, pynbha ia ki bad ia u Resistor bujli noh da uwei. Nangta sa align biang ia ka radio.

Ka juh jia ba ki pin jong ki valve kim iatyngkhuh bha bad ki pin jong u sucket, kumta kane ka wan rah ia kane ka jait jingsniew. Ban pynbha ia kane dei ban sei ia ki valve shabar bad pynkhuid ia kine ki pin jong u valve khnang ba kin iatyngkhuh bha bad ki pin jong u sucket. Ynda la dep leh kumne, sieh biang ia ki valve ha ka set da kaba peit bha ba ki valve kin ym bakla jaka haba sieh ia ki. Kaba bha ka long ban ym sei ia ki baroh ha kajuh ka por. Sei shwa tang uwei u valve bad pynkhuid ia u bad ia ka sucket. Nangta sa sieh biang ia u bad leh hi kumjuh ia kiwei kiwei pat. Teng teng la juh lap ba ki pin jong ka sucket ki kdor bad kim iadei bad ki pin jong u valve. Pynbeit ia kine da ka nap khapshiah kaba nep khmut bad sa sieh ia u valve. Ynda la dep, pynmeh ia ka radio bad sngap ka la riew jam ne em.



Thew ia ki voltage jong ki valve baroh ha ka valve tester da kane ka valve tester lah ban tip kino ki valve kiba la tlot Lada don kiba sniew ne tlot pyndait noh da kiwei pat kiba thymmai, bad lada ym don valve tester, sei noh ia u valve jong ka IF stage, Audio amplifire stage bad ka bynta jong ka frequency bad sieh noh da kiba thymmai. Pynmeb ia ka radio bad sngap ka la riew jam ne em. Leh ha kajuh ka rukom ia ka Rectifier valve. Haba thew ia ki valve ha ka valve tester dei ban da ia nujor bad ka valve data, khnang ban tip uno uba dang bha bad uno la uba sniew.

La juh shem ruh ba ki trai ki juh ktah ia ka radio lane ki pynkhuid ia ki pum pum shapoh Kumno re kumno ki kum pyndkut ia ki sainar u Loop antenna coil kblem da tip ei ei namar ba u long uba sting. Kumta da ka jing-pyndkut ia kine ki sainar, ka radio kam lah kjit ia ka jingrwa bad ka radio ka kylla tlot boi noh. Pyndait pain biang ia kine ki sainar kiba la dkut ha ki jaka kiba dei ban don, da ianujor bad ka circuit diagram. Ka juh jia ba kine ki coil ki juh iatyngkhuh ne short para ma ki da ka-ka jingiatyngkhuh jong ki ka wan rah ia kane ka jait jingsniew. Pynbha ia kine ruh

Lada kitei baroh haneng ki bha, phai biang sa sha ki valve Pynkylla ia ka ohasis da khongpong khnang ban ioh ban thew ia ka voltage jong ki. Pynmeb ia ka radio bad shim ia u meter Pyndait ia u sainar iong sha ka chasis bad ia u sainar saw pat thew ia ka voltage jong ki. Kaba dei ban thew ka long ia ka voltage kaba don ha u plate, u screen, u cathode bad ia ka negative voltage jong u grid Haba leh kumne da ianujor bad ka valve data. Lada shem ba ka voltage ka duna ne bun, kaba dei ban peit ka long ia ki bypass condenser bad ia ki Resistor. Lada ki la sniew loit noh ia ki bad pyndait noh da kiwei. Ia ka rukom thew ia ki condenser bad ia ki Resister leh hi kumjuh kumba la bthah. Kaba dei ban peit mynta ka long ia ki Osilator circuit. Thew ia ka voltage kaba leit sha ka Mixer stage. Lada kane ka voltage ka duna ka pynlong ia ka jingduna ka voltage ha u grid uba dei ha ka mixer

stage. Namar kata kaba dei ban peit ka long ia u coupling condenser lane uno uno u jait uba trei la kane ka jait kam. Lada u la sniew, weng noh ia u bad pyndait da uba thymmai uba dei kajuh ka bor bad uba la sniew.

Teng teng la juh shem ruh ba haba ki coil kum ki IF coil ne Osilator coil ki lait na ka jaka ba la kynthah pain lane dkut bad short ki wan rah ia kane ka jaid jingsniew. Peit bha ia kine ki sainer khnang ba kin ym lait ne short. Thew ia ka continuity bad resistance jong kine ki coil da u meter. Haba ki sainer ki iatyngkhuh para ma ki, ki juh wan rah ia kane ka jait jingsniew. Peit bha bad pynbha ia ki. Haba la pyrshang katne ruh ka radio kam mau niew satia. Kaba dei ban leh ka long ban weng noh ia kito ki coil kiba la sniew bad ban pyndait noh da kiwei kiba thymmai. Pyndait ruh ia ki trimmer condenser da kiba thymmai bad ia ki coupling condenser lada ki la sniew.

Haba ki RF transformer ki la sniew, ki juh wanrah ia kane ka jait jingsniew. Peit bha ia ki bad lada ki la sniew pyndait noh da kiwei pat kiba thymmai,

## KA AC/DC SET

Kum kane ka jait jingsniew ha kane ka jait Radio kaba dei ban peit bha ka long ia u Power Resistor. Pynmeh ia ka Radio, nangta sa thew ia ka voltage jong une u Resistor da u meter, ia ka Filament voltage bad ia ka Plate voltage kaba leit sha u Rectifier valve. La ju shem bunsien ba ki trai radio ki ktah ia ka radio da kaba pynkiew ne pynbhar ia ki sainer (Tapping) jong une u Power Resistor. Lada shem ia kane ka jingbakla pynbeit ia ka voltage kaba dei ban ai sha u Rectifier valve. Haba leh kumne da ia nujor bad ka VALVE DATA. Lada ka voltage ka duna, pynkham iajan ia kine ki sainer (Tapping) tad haduh ban da biang ka voltage kaba dei ban ai sha u Rectifier Valve. Haba kwah ban thew ia ka Resistance, pynlip shwa ia ka radio bad sei noh shwa ia u Rectifier Valve. Da u meter thew ia ka Resistance na ki jingpyn-

dait (Tapping) jong u Power Resistor. Ka Filament Resistance ka dei ban long 1000 Ohms bad ka Plate Resistance pat ka dei ban long 250 Ohms.

Ia kiwei ki jingsniew ki long hi kumjuh kum ha ka transformer set bad leh hi kumjuh haba wad ia ka jingsniew bad leh ha kajuh ka rukom ha kaba pynbha ia ka.

## KA TRANSISTOR SET

Ha kane ka jait set, la juh pyndonkam da ki Battery. Thew ia ka voltage jong ki bad lada ka duna bor, pyndait noh da kiba thymmai. Pynmeh ia ka radio bad sngap ka la riew jam ne em, peit ioh don ka jinglait ki sainar ha ka radio lada don kiba lait pyndait biang ia ki. Haba leh kumne da ia uujor bad ka circuit diagram khnang ban ym bakla haba pyndait ia ki.

Pyndei da u screw driver na u volume control na uto u pin uba hagdeng bad pynbeh ia ka volume. Lada ka jingpah ka jur kata ka mut ba ka Audio amplifier ka bha, bad lada ka tlot kata ka mut ba ka Audio amplifier ka don jingsniew. Thew ia ki Audio conpling condenser bareh. Ia ka rukom thew leh hi kumjuh kumba la bthah. Lada kine ki coupling condencer ki sniew loit noh ia ki bad pyndait da kiba thymmai kiba don kajuh ka bor bad kito kiba la sniew. Thew ruh ia kito ki condencer kiba don ha ka circuit. Lada ki la sniew, loit noh ia ki bad pyndait noh da kiba thymmai kiba don kajuh ka bor bad kito kiba la sniew

Kajuh jia ba ki trai radio ki khyrwait ia ki Trimmer jong ki IF Transformer bad kiwei kiwei Pynbha da kaba align ia ki IF Transformer jong ka Ia ka rukom align leh kumba la bthah ha ka jingkdew lamphrang.

Haba kine ki bha phai sa sha u Diode bad ki Osilator coil. Thew da u meter ia kine. Lada u Diode u la sniew loit noh ia u bad pyndait noh da uba thymmai. Bad lada ki coil ki lait na ka circuit ne sniew. Pynbha ia ki bad lada ym lah pyndait noh da kiwei kiba thymmai.

Peit ruh ia ki sainer jong u Loop Antena coil. Lada ki dkut pynbha iaki da kaba kynthah pain bad peit ruh ba kin nym kynriah jaka na kaba pyndait bthing ia ki Lada ki kynriah na kata ka jaka ba la buh ka wanrah ia ka jingsniew. Pynbeit ia kane da kaba pynkhih sharum shaneng haduh ba kin da ai iaka jingrwai kaba jam Nangta sa pyndait bthing iaki ha kata ka jaka. Haba pynkhih kumne, pynkhih da u dieng ym dei da u screw driver.

Peit ruh ia u Convertor Transistor, lada u la tlot sei noh ia u bad pyndait da uba thymmai uba kajuh ka jait. Wad ruh da ka signal injector ia kiwei kiwei ki bynta kiba don ha ka Circuit khnang ban tip kaei ka daw kaba pynlong kumne ia ka radio, Ia ka rukom wad leh hi kumjuh kumba la bthah.

Peit ruh ia ki Output Transistor bad u Output Transformer. Lada uwei na kiue u bynta u sniew u juh wanrah ia kane ka jingsniew. Weng noh bad pyndait da uba thymmai uba dei kajuh ka number ne bor bad uto u ba la sniew. Ia ka rukom wad ia ka jingsniew leh hi kumjuh kumba la bthah ha ki lynnong kiba sha khmat.

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## SKA LYNNONG KA BA PHRA

(KA RADIO KABA PAH KUM KA THUP THUP)

Ki daw kiba pynlong ia kane ka jingpah ki long (1) ka jingorpait jong ki valve (2) Ka jingsniew ha ka IF bad RF amplifier stage (3) Ka jingsniew jong ki condencer bad ki Resistor.

### KA TRANSFORMER SET.

Ha kane ka jait set bad kum kane ka jait jingsniew, kaba nyngkong kaba dei ban leh ka long ban pynmeh iaka set bad pynneh pynrit ia ka jingsawa da kaba khyrwait ia u volume control. Ha ka por ba leh kumne. Sngap ia ka jingriew bad ia ka jingpah thup thup ka don jingpher ne em. Lada em, kata ka mut ba ka don jingsniew ha ka bynta jong ka Audio kaba khadduh. Lada ka jingpah thup thup ka don jingpher, hyurei ka jingriew ka sah kumjuh, Kata ka mut ba ka don jingsniew ha ka bynta jong ka Audio kaba nyngkong. Bad lada ka jingriew ka jah da kaba khyrwait ia u volume control, kata ka mut ba ka jingsniew ka don hajan une u volume control.

Pynlip ia ka radio bad loit iaka jingkah kaba na shadien. Peit ia ki valve ki don jingorpait ne em. Lada don jingorpait, ka lyer ka loh rung shapoh ki valve bad ki kylla lieh hapoh jong ki. Sei noh ia kine ki valve kiba la kylla lieh bad sieh noh da kiwei kiba thymmai kiba dei kajuha ka number.

Lada kine ki bha, sei ia ka chasis shabar. Nangta pynmeh ia ka radio bad sa thew da u meter ia ka voltage jong u Electrolicite Condenser khamtam ia ka bynta jong u Output jong u. Ia ka rakom thew leh kumba la bthah. Lada une u bynta u la sniew' u juh wanrah ia kane ka jait jingsniew. Loit noh ia u bad pyndait noh da uba thymmai uba dei kajuha ka bor bad uta uba la sniew. Lada kitei ha-neng ki bha, peit ia ki sainar kiba pyndait bad ka speaker ba kin ym ia kyrshut bad ki sainar jong ka Audio stage, Peit ruh ba loh ki sainar ki lait na ka circuit, khamtam ia

kito ki sainar jar kiba dei ban leit sha ka chasis ne ground. Pynbha ia kine da kaba kynthah pain biang ia ki ha ka circuit.

Lada kitei haneng ki bha, phai mynta sa sha ki Filter condenser. Thew da u meter ia ka voltage jong ki lane da ka continuity. Tang haba thew. dei ban da weng noh uwei u kjat na ka circuit bad da pynlip shwa ia ka bor jong ki da kaba pynla short uwei u sainar na ka Positive line bad ka Negative line, nangta sa thew ia ka continuity jong ki. Lada ym leh shwa kumne, u meter u lah ban sniew noh. Ia ka rukom thew leh kumjuh kumba la bthah. Haba thew ia ka voltage da ia nujor bad ka valve Data. Lada shem ba kine ki la sniew loit noh ia ki na ka circuit bad pyndait da kiwei kiba thymmai kiba don kajuh ka bor bad kito kiba la sniew. Ka jingsniew jong kine ki condenser ka long kaba juh jia khah khah.

Lada kine baroh ki bha phai mynta sha ka Audio Circuit. Thew da u meter ia u Output Filter Condenser lada shem ba u la sniew. Weng noh ia u bad pyndait da uba thymmai. Thew ruh ia ki condenser kiba la pyndait ha u plate, ha u screen bad ha u cathode kiba don ha ki valve jong kane ka byota. Lada don jingsniew ha kine, pyndait noh da kiba bha. Thew ruh ia ka continuity jong kito ki Resistor kiba don ha kane ka bynta (circuit) da kaba pynlip shwa ia ka Radio. Lada shem ba ki la sniew pyndait noh da kiba bha. Thew bha ia uto u Condenser uba pyndait hagdeng jong ki Resistor bad uba leit sha ka chasis ne ground. Lada u la sniew ne leak, pyndait noh da uwei uba don ka juh ka bor. Thew ruh ia ka voltage jong kine ki valve bad da ia unjor ia ka voltage jong ki bad ka Valve Data. Lada don kano kano ka jingbakla ha ka voltage jong kine ki valve, sei noh ia uto u valve bad pyndait noh da uwei uba thymmai. Nangta sa pynmeh ia ka Radio bad ngap la kane ka jingpah ka la jah ne em.

Lada kitei kiba la kdew haneng ki bha, phai mynta sha ki RF bad IF stage. Khnang ban pynduna ia ka por ban trei, sei noh shwa ia kito ki valve jong kine ki bynta.

bad pyndait noh da kiwei kiba thymmai. Lada ym don jingiarap ei ei haba leh kumne, thew ia ki condenser kiba pyndait sha u plate, sha u screen bad sha u cathode jong kine ki valve. Lada ki la sniew weng noh ia ki na ka oir-ouit bad pyndait da kiba thymmai kiba dei kajuh ka number. Thew ia ka resistance jong ki Resistor kiba pyndait ha kane ka circuit. Lada ki la sniew weng noh ia ki bad pyndait da kiwei kiba bha kiba don ka juh ka bor. La juh shem ba haba ki Resistor ki kylla ka bor jong ki, ki juh wanrah ia kane ka jingsniew pynbha ia ki bad da ia nujor ia ka voltage jong ki bad ka valve Data.

Lada kitei haneng ki bha phai mynta sha ki IF Transformer. Thew da u meter ia ki. Lada don jingsniew pynbha ia ki. Lada ym lah, pyndait noh da kiba thymmai: Nangta sa align blang ia ki. Lada bakla align ka juh wanrah ia kane ka jait jingsniew.

### KA AC/DC SET

Ha kane ka set, ka jingsniew ka juh long ba (1) La sniew u Output Filter Condenser (2) Ba la sniew ki valve (3) bad ki bypass condenser kiba don ha ka bynta jong ka RF bad Audio ki la sniew.

Kiwei kiwei ki jingsniew ki long kumjuh kum ha ka Transformer Set bad leh hi kumjuh ha kaba wad bad pynbha ia ki kumba la bthah ha ka Transformer Set.

### KA TRANSISTOR SET

Ha ka Transistor Set ki daw kiba pynlong ia kane ka Radio ba kan pah thup thup ki long kiba bun jait. Kumta ka long kaba eh ban thoh iwei pa iwei i jait jingsniew. Kine harum ki long tang katto katne ki daw kiba juh jia khah khah.

Kaba nyngkong ka long ban peit ia ki battery. Lada ka battery ka long high impendence, ka radio ka long kumne. Sei noh ia ki bad pyndait da kiba thymmai. Phai pat mynta sha ki IF Transformer bad u Gang condenser.

Lada kine ki IF Transformer bad Gang condenser kim iadait pain bha bad ka chasis ne ground ki juh pynmih ia kane ka jait jingsniew. Haba kito ki tin kiba sop ia u IF Transformer ki lait na kaba pyndait pain sha ka ground. pyndait bha ia ki. Peit bha ba kan ym don dry soldering. Kumjuh ruh ia u Gang condenser pyndait pain bha ia uto u kjat jong u, uba dei ban ia kynduh bad ka ground ne chasis. La juh shem ruh ba ki sainar jong ka ground jong ka printed circuit ki lait na kaba kynthah pain bad ka chasis da ka jinglait jong kine ka juh wanrah ia ka jiagsniew. Pynbha ia kine.

Lada kitei ki bha, phai mynta sha ki sainar Arial bad sha ki sainar jong ka Speaker. Bunsien la juh lap ba, haba kine ki sainar ki leit kum iajan than bad ki bynta jong ki IF Transformer, ka radio ka juh pah kumne khlem da sniew ei ei ruh em ha ka. Peit ba kine ki sainar kin ym ia jan bad kane ka bynta. Lada ki iajan, pynkynriah ia ki.

Ynda la dep, phai mynta sha ki Bypass condenser jong ka radio. Thew ia ki da u meter. Ia ka rukom thew leh hi kumjuh kumba la bthah. Lada ki Bypass condenser ki la sniew weng noh bad pyndait noh da kiba thymmai kiba don ka juh ka bor. Thew ruh ia ki Neutralizing condenser da u meter. Lada kine ki la sniew sei noh ia ki bad pyndait da kiba bha kiba don ka juh ka bor.

Kaba khatduh kaba dei ban peit ka long ia ki Resistor. Lada kitei kiba la kdew haneng ki bha lut. Thew ia ka resistance jong ki Resistor kiba don ha ka circuit bad da ia nujor bad kaba dei ban don, kat kum ka circuit ha ka circuit diagram. Teng teng ki Resistor ki kylla bor noh na kaei kaba ki dei ban don. Kumta ka jingkylla bor jong kine ki juh wanrah ia ka jingsniew. Sei noh ia uta uba kylla bor bad pyndait da uwei u Resistor uba iadei bor ha kata ka bynta jong ka circuit. Ia kane ka jait jingsniew la juh shem ba ki Resistor kiba dei ha ki IF Transformer ki juh kylla bor kumne. Peit bha ia ki Resistor kiba don ha kane ka bynta.



## KA LYNNONG KA BA KHYNDAI

### KABA PYNBHA IA KA SPEAKER

Ha kane ka lynnong ngin ia kren shaphang kumno ban pynbha ia ka Speaker kaba la sniew. La bynta ia ka jingniew ha ki lai bynta :—

(1) Ka jingorpait lane la sniew ka cone (2) Ka jingshong centre bakla u coil ha ka speaker. (3) Bad ka jingdkut lane ing ki coil.

(1) Ka jingorpait lane la sniew ka cone :—Haba ka cone jong ka speaker ka orpait ka wanrah ia ka jingriew khar khar ha ka speaker. Kumta bau pynjah ia kane ka jingriew loit shwa ia ka speaker shabar bad peit ia kata ka jingorpait ka heh katno. Lada ka jingorpait ka long kaba rit, pyniaryntih lang ia kito ki jingorpait bad sa pynjaw da ka q ickfix halor ka e ka jingorpait. Tang ba ka jingpynjaw kam dei long kaba rben. Da leh katba lah ban pynstang ia kane ka jingpynjaw da kaba naid da u screw driver ia kata ka jaka ba la pynjaw. Ynda la dep buh ia ka speaker ha ka jaka bym don jingpynwit khnang ba kata ka jingorpait kan ym shong bakla ne kynriang Ap haduh ba ka quickfix kan da rkhiang bha: Bad ynda la rkhiang sa pyndait biang ha ka radio.

Lada ka jingorpait ka la bun than ne ka cone ka la sniew palat loit noh ia kane ka cone bad pyndait da kaba thymmai Pynjaw ia ka Thinner da u dropper ha baroh sawdong jong kane ka cone kaba pyndait bad ka frame jong ka speaker. Ynda ka jingtah ka la um pynkhih ia kane ka cone da ka tari kaba nep khnang ba kan lait na kane ka frame. Nangta sa pynjaw biang da ka Thinner ha kato ka jingtap kaba don t apdeng ka cone bad sa weng noh shwa ia ka. Ynda la dep leh kumne pynjaw biang da ka Thinner ha kato ka bynta kaba pyndait ia ka cone jong ka speaker bad ia kato ka kot kaba shong u coil khnang ba ka cone kan lait shabar na ki. Haba pynjaw da ka thinner ha kane ka bynta kynmaw ba ka thinner kam dei has tukit

sha u coil, Lada ka tuid sha u coil, u coil un sniew noh. Ynda la dep loit lut ia kane ka cone kaba la sniew, pynkhuud bha ia kato ka frame jong ka speaker da ka tari nep.

Khap 3 (lai) tylli ki kot (Shim) kaba kham rben ban ia ka kot sada kaba jrong kumba 4 kti ka lynter la  $\frac{1}{2}$  kti ka pyngkiang bad khap pynnep ia ki tang na kawei ka liang : Sieh ia kive k' kot hapdeng jong ki coil bad u Magnet ha ki laidong Nangtashim ia ki cone kaba thymmai kaba ia ryngkat bad kata kaba rim Ot ia kato ka pdeng jong ka kat kum ka jingpyllun jong kato ka thliw jong u coil uba don ha ba speaker Pynjaw baroh sawdong da ka quickfix ia kato ka bynta kaba pyndait ia ka cone ha ka frame. Nangta sa thep ia kane ka cone ha ka speaker bad pyndait ia kato ka bynta kaba ia kynduh bad ki coil da ka quickfix Ia kato ka bynta kaba iadait bad ka frame pat shu syrpuud da ka kti khnang ba ka cone kan iadait bha bad ka Frame. Ynda la dep leh kumne buh ia kane ka speaker haba ioh lyer ne engi khnang ba kan rkhiang bha. Hadien kumba shikynta ei ei sei noh ia kito ki kot (shims). Nangta sa engap la u Coil u shong centre bha ne em ha u magnet da kaba pynkhih sharum shaneng ia ka cone da ka kti. Lada u coil um ia kynduh bad u Magnet kata ka mut ba la bha. Pyndait biang ia ita i jingtap i ba tap ha u coil bad sa pyndait noh ia ka speaker ha ka radio.

(2) Ka jingshong centre bakla u coil ha ka speaker :—

Haba u coil u shong centre bakla ka radio kam riew bha shuh wet la ka jingrwai ka wan, hynrei ka jingpynwit ka pynthut kat haduh bym engewthuh shuh ia ka jingrwai. Kumta kaba dei ban leh ka long ban loit noh shwa ia ito i jingtap iba tap halor u coil. Pynjaw da ka thinner ba baroh sawdong jong ine i jingtap. Ynda ka jingtah ka la um, sei noh ia ita i jingtap da kaba khoh da ka tari rit kaba nep Sieh ia kito ki lai tylli ki kot (Shims) hapdeng ki coil bad u magnet ha ki lai bynta Nangta pynieng da pyrshing ia ka speaker bad sa pynjaw ia ka thinner da u drop-per ha baroh sawdong jong kato ka bynta jong ka spider ka ba pyndait bad ka Frame jong ka Speaker Haba kane ka jingtah ka um, ka spider kan kynriah jaka tad haduh ba u

coil un da shong centre bha Ynda ka thinner ka la rkhiang, ka jingtah ia kane ka spider ruh kan rkhiang pat. Sei noh ia kito ki kot (shims) Bad sa pyrshang la u coil u ia kynduh ne em bad u magnet. Lada ka jingiatyngkhuu kam don shuh kata ka mut ba la bha Ynda la dep leh kumne sa tap biang ia ito i jingtap jong u coil. Bad shwa ban tap kumne da pynkhuid bha ia kato ka bynta ba shong une u coil khnang ba ki nuit kin ym ioh rung shapoh u magnet. Nangta sa pyndait biang ia ito i jingtap da kaba pynskhem biang ia i da ka quicfix Ynda la dep lut baroh pyndait biang ia ka speaker ha ka radio. Pynmeh ia ka radio bad snagp ka la bha ne em.

(3) Ka jingdkut ne la ing u coil.—Lada u coil jong ka speaker u dkut ne ing, ka radio kan ym wan jingrwai, haba tem ia ka Kaba dei ban leh ka long ban sei noh ia ka speaker shabar na ka radio ban pynbha biang ia ka, Loit noh ia ito i jingtap iba don hapdeng jong ka speaker da kaba pynjaw da ka thinner khnang ba yn lah ban sei ia uto u coil. Haba sei kumne da pyndonkam da ka nap rit khnang ba kato ka kot kaba sop ia u coil kan yn sniew.

Nangta shim ia uto u coil uba ing lane dkut, loit suki suki ia u bad lade u dkut, bteng biang ia u. Leh kumne haduh ba un da lait lut na kato ka kot Nangta shim pat da uwei u coil uba thymmai uba iaryngkat kajuh ka jing-rben bad uto uba la sniew. Thew ia ka jingjrang jong une u coil thymmai bad uto uba la sniew.

Nangta shim bad sa khap jrang khyndiat ia uto u coil thymmai na uto u coil uba la sniew. Nangta shim ia uto u coil thymmai bad thew ia u mar shiteng bad buh dak ia kane ta jaka ba mar shiteng. Shua da uwei u nar uba ia ryngkat bad kato ka kot kaba kyllain coil rim, bad thep ia ka ha une u tiar uba ia ryngkat bad ka jingpyllun jong ka. Nangta sa kyllain biang ha une u coil thymmai halor jong ka Haba kyllain kumne da pyntam ia uto u khmat coil kumba 6 kti ei ei. Pynskhem malu mala ia une u khmat sainar da ka gum bad sa kyllain Kumta haba kyllain kumne peit ba une u coil un ym ia kiew uwei halor

uwei bad wat pyniar ia kine ki coil. Leh ia kane da ka jinglarap jong ka iit shna baje. Ynda la poi ha kata ka jaka ba la buh daksangeh noh shwa. Kyllan ia une u coil uba la dep kyllain da ka coil dobe bad sa adang ban kyllain arted halor jong kine ki coil kiba la dep kyllain khnang ba kin long ar airtap Ynda la dep kyllain kumne, sa kyllain biang da ka coil dobe khnang ba u coil un iasyndait bha bad kato ka kot. Ap haduh ba une u coil un da rkhang bad sa sei suki ia kato ka kot kaba la pyndait ia u coil na uto u tiar. Haba sei kumne peit bha ba uto u coil un ym duh na ka jinglong pyllun.

Kyrshut da ka kot sirls ia kato ka jaka ba pyndait ia une u coil ha ka speaker, khnang ba kato ka thliw kan kham heh khyndiat ka jingpyllun. Ynda haba thep ia uto u coil thymmai un ym ia kyrshut eh bad ka cone. Nangta sa pynkhuid ia kato ka thiew kaba un shong une u coil. Pynkhuid bha da u brush uba rit bad ialeh katba lah ban weng lut ia ka jaboh kaba rung hangta. Ynda la dep pynkhuid sa thep la uto u coil thymmai ha kata ka thliw. Nangta sieh pat ia kito ki kot 3 (Slims) tylli hapdong jong une u coil Haba leh kumne peit ba ka cone kan ym khem ia kato ka kot jong u coil. Peit ruh ba ka jingrung jong u coil shapoh u magnet kan long hi thik kat kum uba rim. Ynda shem ba ka la bha lut baroh sa pynjaw baroh sawdong da ka quickfix khnang ba ka cone kan iadait bha bad ka kot jong uto u coil. Nangta ynda la rkhiang sa sei noh ia kito ki 3 tylli ki kot (shims) na u coil, pyrshang ban snagap la u coil u ia kynduh ne em bad u magnet da kaba pynkhih ia ka cone da ka kti. Lada em, kata ka mut ba la bha. Pyndait biang ia ito i jingtap ha u coil bad ia kito ki khmat sainar ha ki pin jong ka cone kiba don ka jingiadei bad kito ki pin jong ka speaker. Pynjaw da ka quickfix halor kito ki khmat sainar ki jong u coil khnang ba kin ia syndait bad ka cone. Ynda la rkhiang sa pyndait ia kane ka speaker ha ka Radio Nangta sa pyameh ia ka radio bad ka jingrwai kaba shai bha kan wan.

## KA LYNNONG KA BA SHIPHEW

### KABA PYNBHA IA KA RECORD PLAYER

Ha kane ka lynnong, ugin ia kren shaphang kumno ban pynbha ia ka record player. La bynta ia kane ha ki lai bynta (1) Ka jingsniew ha u coil (2) Ka jingsuiew ha u Motor (3) Bad ka jingsniew ha u Pick-up.

1. Ka jingsniew ha u coil (AC current):—Lada u Motor um iaid haba pynmeh ia ka record player, kaba dei ban leh nyngkong ka long ban peit ia u plug. Shim ia u plug ka record player had thew ia ka continuity da u meter na kito ki pin jong u (Ia ka rukom thew la bthah ha ki lynnong kiba sha khmat) Katba nangthew kumne pynkhih ia u switch da kaba pynmeh pynlip ia u. Lada u meter um pyni continuity eiei, loit ia ka jingtap jong u plug, bad peit ba iohki sainar ki lait. Lada don ba lait pynbha ia ki. Nangta loit ia ka player bad pynthiah ia ka da lyndang khnang ban kham suk ha kaba wad ia ka jingsniew kaba don ha ka. Teh shwa ia kito ki pin jong u plug da ki sainar lyngkhuit nangta sa thew ia ka continuity jong une u sainar na kawel ka liang, ka bynta kaba pyndait ha ka Record Player. Lada u meter u pyni continuity kata ka mut ba uto u sainar na ka record player haduh u plug u dang bha. Loit noh ia kito ki sainar kiba teh.

Haba kine ki sainar ki bha, phai mynta sha u switch. Thew ia ka continuity jong u switch na kito ki pin kiba don ha u. Katba nangthew kumne pynkhih ia u switch da kaba pynmeh pynlip ia u. Lada um pyni continuity kata ka mut ba u switch u la sniew. Weng noh ia u bad pyndait da uwei uba thymmai. Hynrei lada shem ba une u dang bha phai mynta sa sha u coil. Thew ia ka continuity jong u coil na kito ki pin jong u. Lada u meter um pyni continuity ei ei kata ka mut ba u coil u la sniew. Weng noh shabar ia u Motor na ka Record Player, nangta loit ia ka frame jong u coil da kaba pyndonkam da ka vise u Tyrenem, bad u shniah, Ynda la dep loit, shim ia kata ka shake kaba kyllain coil bad loit ia uto u coil haduh ba un da lut na

kata ka shaka. Teng teng la juh shom ba haba u coil u ing u juh pynum ia kato ka shaka plastic. Pynbha ia kata da kaba kyrshut da u Sorti (file) bad sa sop kot kumba shi kyllain shapoh kane ka shaka bad sa sdang ban kyllain da uwei pat u coil uba thymmai ha ka uba kajuh ka jingrben bad uba rim. Haba kyllain kumne, da pynmih ia u khmat jong une u coil shwa shabar kumba 6 kti ei ei Kaba dei ban kyllain ka long 4,000 sien kyllain. Haba kyllain kumne, lada jia ba u coil u dkut, pynkhuid ia kito ki khmat kiba dkut da ka tari nep bad sa pyndait pain ia ki. Nangta sa sop da ka Chilo tape halor kane ka bynta ba la pyndait pain bad sa kyllain biang ia u coil. Ynda la dep kyllain kumne sop biang ia une u coil da kito ki kot na jrong jong u bad sa pyndait pain biang ia kito ki khmat sainar ha kito ki pin kiba don ha kane ka kot kaba sop ia u coil. Nangta sa pyndait biang ia une u coil ha ka frame.

Ia ka rukom kyllain ia u coil, kyllain ha ka kor kyllain coil lada don bad lada ym don lah ban kyllain da ka jingiarap ka Hand Drill. Shim ia kato ka shaka kyllain coil, sieh da u Balto hapoh kato ka thliw jong kato ka shaka bad sa sieh haka Hand Drill Nangta shim pat ia ka hand drill pyndait haka vise bad sa kyllain ia u coil da kaba khyrwait ia kane ka hand drill. Ynda la dep kyllain ia une u coil ha kato ka shaka, loit noh ia ka shaka na ka hand Drill bad sa pyndait ha kato ka frame. Nangta pyndait ia nto u Motor ha ka Record Player, bad sa kynthah pain biang ia kito ki sainar, Pynmeh ia ka Record player. Lada u Motor u shad kata ka mut ba u la bha, bad lada um shad kata ka mut ba la don ei ei kaba pynlong ia u Motor ba un ym shad

## (2) Ka jingsniew ha u Motor (AC current)

Loit noh ia u motor na ka record player bad loit ia u motor na ka frame jong u. Nangta sa sait ia u motor bad ia ka frame jong u da ka petrol da pynkhuid bha ia kito ki thliw ba shong u marble sisa. Ynda la dep sait ia kine, pynjaw umphniang khyndiat ia kato ka thliw ba don u marble sisa, nangta sa thep biang ia u motor. Kaba dei

ban kynmaw ka long ba ym dei ban thep ia u motor khlem da thep shwa ia u marble sisa Lada une u marble sisa um don, u motor um ym ia id bha Haba thep kumne ia u motor ha ka frame jong u peit ruh ba u motor un shong centre bha, lada um shong centre pynbha ia kane da kaba pynbeit da u screw driver na kito ki thliw kiba une u motor u rung. Ai umphniang ia kito ki thliw tang malu mala tang ba u motor un tyllun. Haba ai umphniang ai da ka umphniang baje. Nangta pyrshang khyrwait ia uto u motor da ka kti. Lada u shad bh kata ka mut ba u la bha, bad sa pyndait noh ia u ha ka record player. Pynmeh ia ka record player. Lada u motor u shad bha kata ka mut ba u motor u la bha.

Haba ka pliang jong ka record player ka shad suki, lane kam beit ha ka jingshad jong ka, kaba dei ban peit ka long ia u spring uba pyndait na uto u shaka jri jong ka record player. Lada une u synjor than ne pyrkhing than eh ruh ka pliang kam shad bha. Pynbha ia kane da kaba ring pyrkhing kat ban biang ia u spring Peit ruh ia kane ka shaka jri ba ioh ka ia tyngkhuh hapdeng jong ki ar speed ha u motor. Lada ka iatyngkhuh kumne ka shaka jri kan sniew noh. Pynbha ia kane da kaba pynbeit ia uto u Gear wheel uba sieh ha u motor. Lada ka shaka jri ka la lut shiliang, loit noh ia ka bad pyndait noh da kaba thymmai.

## KA JINGSNIEW HA U MOTOR (DC CURRENT)

Mynta ngin lakren ia u motor DC lane Motor Battery jong ka Record player. La juh shem ba ka jingshad jong une u motor ka juh suki. Khoh ia kato ka kot kaba tap ia kato ka thliw kaba don ha ka krung jong une u motor. Nangta khyrwait ia u motor na u gear wheel haduh ba kito ki screw kiba don hapoh u motor kin da paw ynda peit na kane ka thliw. Sieh da u screw driver na kato kathliw bad khyrwait skhem khyndiat ia une u screw. Sei noh shwa ia u screw driver na kato ka thliw. Nangta pynshad suki ia u gear wheel tad haduh ban da iohi pat sa ia uwei u screw. Ynda ia iohi ia uto u screw, sieh biang ia u uto u screw driver bad khyrwait skhem khyndiat ia uta u

screw. Pynmeh ia ka record player. Peit la ka speed ka la biang ne em, lada kam pat biang leh kumne haduh ba kan da biang.

Ki don kito ki jingthoh shaphang ki speed 78, 45, 33½ bad 16 kaba mut ka jingshad pyllun jong ka pliang ha ka shiminit. Haba buh ia u gear ha u 78 kata ka mut baka pliang ka shad pyllun 78 sien shi minit bad kumta ter ter. Kaba dei ban kynmaw ka long ymdei ban pyndei petrol ne umphniang ha une u motor, lada pyndei u motor un sniew noh.

### (3) KA JINGSNIEW HA U PICK-UP.

Haba wad ia ka jingsniew u Cyrstal ne u pickup kaba dei banleh ka long ban sieh ia kito ki sainar jong u pick-up ha ka radio. Pynmeh ia ka radio bad buh ia ka ha ka pick-up Band. Sei noh shwa ia u sainar negative jong ka pick-up. Nangta bat da ka kti ia uta u sainar negative jong ka pick-up uba wan na ka record player bad sngap la ka don jingpah (Audio hum) ne em ha ka speaker jong ka radio. Lada ym don pyndei da ka kti ne da u screw driver haka bynta jong u pick-up uba la pydait ha ka record player. Sngap la ka jingpah ka don ne em, lada em pyndei sa uta uwei u pin jong u pick-up uba haka record player. Lada hangne pat ka jingpah ka don bad ka jur bha, kata ka mut ba u pick-up u la sniew. Weng noh ia u bad pyndait noh da uwei uba thymmai. Nangta sa sieh biang ia uta u sainar negative haka Radio.

Lada ki sainar ki lait na u pick-up ym dei ban kynthah pain ha kito ki pin jong u. Kaba dei ban leh ka long ban sei ia kito ki sucket kiba pyndait ha kito ki pin jong u pick-up shabar. Nangta sa pyndait pain ia kito ki sainar ha kito ki sucket. Ynda la dep pyndait pain iaki sa sieh biang ha kito ki pin jong u pick-up. Lada kynthah pain khlem da sei ia kito ki sucket shabar na u pick-up. Ka jingkhuid jong u nar kynthah pain kan pynsniew ia u pick-up.



Teng teng la juh shem ba u sainar (Negative line) jong ka Recold player u juh ia tyngkhuh bad uto u sainar uba don hapah jong u. Kumta da kane jingiatyngkhuh ka wanrah ia ka jingbymarwai jong ka Record player haba tem ia ka. Pynkynriah ia kane ka jingiatyngkhuh jong kine ki sainar nangta ka jingrwai kan sa wan bha ynda la tem ia ka.



## KA LYNNONG KA BA KHADWEI

### KABA PYNBHA IA KA ELECTRIC ISTERI (IRON) & KA HEATER

Ha ka Isteri electric bad Heater ki don bun jait ki rukom shna ha la ki jong ki jong ki company. Don kiba rem bad don kiba tad. Hynrei ka tynrai jong ka rukom shna ka long hi kumjuh. Wat la ki Company ki pyniapher kawei na kawei da kaba pynbun tiar kum kaba buh bulb ne control ne Automatic contact bad switch.

### KA ISTERI ELECTRIC

Haba ka electric isteri ka sniew kaba dei ban leh ka long ban thew da u meter ia ka Filament kaba la pyndait ha ka isteri. Lada u meter um pyni continuity kata ka mut ba ka Filament ka la sniew... Loit ia ka jingtap jong ka isteri bad ia kito ki screw kiba la pyndait ia kito ki tin kiba wan na ka Filament. Nangta loit ruh ia kato ka nar kaba ban ia ka Filament. Weng noh ia kane ka Filament kaba la sniew bad pyndait da kaba bha.

Shwa ban pyndait da kawei ka Filament kaba thymmai, pynkhuid bha ia kato ka nar isteri khnang ba kan ym don jingat ne jingthem ha kane ka nar. Lada don jingat jingtem ha kane ka nar ka Filament kan sniew noh. Hynrei lada ka Filament ka shong syndait bha bad kane ka nar, kan kham shan slem. Nangta sdang han pyndait da kawei ka Filament thymmai bad thep ia kito ki nar halor jong ka bad sa pyndait da kito ki not. Haha pyndait ia kane ka Filament peit ba kan ia syndait bha bad ka nar isteri. Kumta dei ban teh skhem bha ia kito ki not. Pynkder ia kito ki tin kiba mih na ka Filament shane bad shatai kumba pynkhuih u bsein bad sa pyndait ia ki bad kito ki pin kiba don ha ka jingtap jong ka isteri.

Shwa ban pyndait ia ka jingtap, thew na u meter ia kito ki pin kiba don ha ka jingtap jong ka isteri. Pyndei ia uwei u sainar ha uto u pin bad ia uwei pat u sainar ha ka jingtap. Lada u meter u pyni ia ka continuity kata ka

mut ba ka don ka jingshort jong kine ki pin bad ka jingtap. Pynbha ia kane khnang ba ki pin kin ym ia dei ban ia short bad ka jingtap. Nangta sdang ban pyndait ia kito ki tin bad kito ki pin jong ka jingtap. Ha ka por ba pyndait kumpe, peit bha ba kan ym don jingiatyngkhuh jong kine ki tin bad ka jingtap. Ynda la dep leh kumpe sa pyndait ia kito ki not kiba pynbat ia u jingbat bad ka jingtap. Haba la dep leh barph sa thew biang ia ka continuity na kito ki pin kiba dop ha ka jingtap bad ka jingtap. Lada kine kim pyni continuity kata ka mut ba ka isteri kala bha. Pynmeh ia kane ka isteri da kaba sieh ia u plug ha ka plug bad hadien katto katne por ka isteri kan wan jingkhuid.

Ha ka isteri kaba don Automatic contact la juh shem bunsien ba ki contact kim ia contact bha. Pynkhuid ia kine ki contact da ka kot siris khnang ba kin khuid ki jakhlia kiba sop ia ki. Nangta sa tap biang ia kato ka jingtap.

## KA ELECTRIC HEATER

Haba ka electric heater ka sniew, kaba dei bad leh ka long ban thew ia ka contunity jong ka heater na kito ki pin jong u plug. Lada u meter um pyni continuity kata ka mut ba ka la sniew. Loit ia ka jingtap jong u plug bad peit ba ioh ki sainar ki lait na ki pin jong u. Lada ki lait pynbha ia ki bad lada ym don ba lait, phai sha ka heater. Thew ia ka continuity jong ka na kito ki screw kiba pyndait ha ka persoline base. Lada u meter um pyni continuity kata ka mut ba u Filament u la sniew. Ha kajuh ka por teh da ki sainar lyngkhuid ia kito ki pin jong u plug bad thew ia ka continuity jong une u sainar uba pyndait na ka Heater sha u plug bad thew na kito ki screw kiba na u Persoline base. Lada u meter um pyni continuity kata kamut ba u sainar ula sniew. Pynbha ia u bad lada ym lah pyndait noh da uba thymmai. Lada u Filament u dkut najan kito ki screw lah ban pynbeit

khyndiat na ka jingpyllon jong u khnang ban ioh ban teh  
 ha ki screw kiba don ha kato ka persoline base.

La juh shem bunsien ba kine ki screw ki bat synjor  
 ia u Filament. Kumta ka heater kam meh bha bad ka  
 pynmih phlieh ding ha kane ka bynta. Pynbha ia kane  
 da kaba teh skhem ia kine ki screw khnang ba kin ia  
 shong skhem bha. Lada u Filament u dkut na pdeng  
 kata la dei ban weng noh ia u bad ban pyndait da uwei  
 uba thymmat. Ynda la dep leh kumne ka heater kan sa  
 bhe.

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## KA LYNNONG KA BA KHADAR

(KA JINGMUT JONGKI RONG KIBA DON HA U  
RESISTOR)

Ha u Resistor la juh loh! ba u don bun jait ki rong. Kine kim dei ki rong ban pynltynad la u hynrei ki don la ka jingmut ha man la iwei pa iwei i rong. Kine harum ki long ki jingmut jong ki rong kiba don ha u Resistor.

Black (Rong iong)	— 0
Brown (Sawjungum)	— 1
Red (Saw)	— 2
Orang (Rong soh)	— 3
Yellow (Stem)	— 4
Green (Jyrngam)	— 5
Blue (Blue)	— 6
Violet or Purple (Sohiong)	— 7
Grey (Ktieh)	— 8
White (Lieh)	— 9

Silver (Rong Rupa) lane golden (Rong ksar) ka Tolerance ka long 10%, bad 20% + lane—. Haba ong 1.meg ohms ka mut 1000000 ohms.

Lada ym lah ban kynmaw la kine ki rong kaba bha ka long ban kynmaw ia kane ka jingong (B.B. Roy of Great Britain has a very good wife). Kata ka mut B=0, B=1, R=2, O=3, Y=4, G=5, B=6, V=7, G=8 bad W=9.

Kane ka jingpyni haneng ka long tang ia kito ar ki rong kiba na khmat kiba don ha u Resistor. Ia ka rong jong uba lai pat, ym dei ban ia nujor da kane ka juh ka rukom kaba haneng. Kaba dei ban leh ka long ban buh tang da ki 0 ha man la ka jingmut jong ki rong. Haba kwah ban tip la ka bor jong u Resistor, shim ia ki jingmut jong kito ki lai tylli ki rong kiba don ha u Resistor ka la blang.

Kine harum ki long ki jingmut jong ki rong kiba don  
ha u Resistor bad kiba dei tang ia kato ka bynta kaba lai.

Black	= 0
Brown	= 0
Red	= 00
Orange	= 000
Yellow	= 0000
Green	= 00000
Blue	= 000000
Violet or Purple	= 0000000
Grey	= 00000000
White	= 000000000

La juh shem ba ki Resistor ki don ka jingthoh rong  
rupa ksiar ha kawei ka bynta jong ka dong jong u. Pynphai  
ia kane ka bynta sha ka liang kamon bad sa ia nujor ia ki  
rong kiba don ha u Resistor. Ka rukom ban ia nujor ka  
long ban sdang na kadiang jong u Resistor bad ban kut  
sha ka-mon.

Lada u Resistor u don ka rong red, black bad brown  
kata ka mut ba ka rong red = 2, black = 0 bad brown = 0.  
Baroh lang ka long 200 ohms. Kawei pat, lada u Resistor  
u don ka jingthoh red. red bad orange bad sha kaba khat-  
duh ka don ka jingthoh rong rupa kata ka mut Red = 2,  
Red = 2, bad orange = 000 Kata ka mut ba u Resistor u  
long 22000 ohms bad ka Tolerance ka long 10% + lane—.  
Haba kut da ki laitylli ki 0 shadien la juh buh da ka  
dak K. Kumta haba ka long 22000 ohms ka dei ban long  
noh 22 K. ohms.

Haba u Resistor u don ki Rong Brown, black bad  
Green kata ka mut 1000000 ohms kaba mut 1 meg ohms.  
Kumta lah ban leh kumjuh ia kiwei kiwei ki rong kiba don  
ha u Resistor.

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